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ORIGINAL COMMUNICATIONS.

CASE OF FIBRO-CYSTIC TUMOUR OF THE UTERUS, WHICH REQUIRED TAPPING; WITH REMARKS.

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CASE. M. G., æt. 47, single, was admitted into St. George's Hospital, under the care of Dr. Wilson, with great swelling and distension of the abdomen. The symptoms, which had existed about twelve months, had been at first confined to the left iliac fossa, but had subsequently spread over the greater part of the belly. Fluctuation was very evident in various regions, and the disease presented all the characters of ovarian dropsy. Œdema of the legs was present, as well as pain in the region of the heart, and difficulty of breathing in going up stairs. The general health had not been much affected, but of late she had lost flesh; the catamenia had been absent for the last six months; the urine was scanty and highly acid. She was put on diuretics and good diet. After five days, it was found that she had decreased two inches in circumference round the abdomen, and that there was also much less swelling of the feet. Under this plan of treatment, she, at first, continued to improve slightly; but the symptoms and consequent distress having subsequently increased, Mr. Hawkins tapped the abdomen, and drew off fifteen pints of thick fluid, of a reddish colour, and mixed, towards the last, with blood and some flakes of lymph. After the operation, it was observed, that the decrease in size had occurred principally on the left side, and two masses of solid substance were detected, which appeared to form part of a tumour, rising from the pelvis. The operation was, at first, followed by marked relief; but, two days afterwards, symptoms of low peritonitis appeared, and the patient died, on the eighth day after having been tapped.

EXAMINATION OF THE BODY, EIGHTEEN HOURS AFTER DEATH. The cavity of the peritoneum contained a large quantity of dark-coloured fluid, mixed with flakes of recently effused lymph, which served to glue together the convolutions of the intestines. In its lower two thirds,

the abdomen was occupied by a large tumour, which, rising out of the pelvis, had displaced the intestines, and become attached, by slight adhesions, to the anterior wall of the belly. The upper part of this tumour was composed of large, membranous-looking cysts, with thin walls, the interior of which was inflamed, and filled with a quantity of thick, dark-coloured fluid. It was one of these cysts which had been tapped during life. Towards its lower part, the tumour was principally formed of a more solid substance, and filled with an enormous number of cysts, varying from the size of a pin's head to that of a large orange. These cysts, which were all lined with a thin, smooth, delicate-looking membrane, were filled with clear fluid, containing a large quantity of albumen. The diseased mass was, at first, thought to be connected with one of the ovaries, but both these organs were found to be lying behind it, and quite healthy. On further inspection, the tumour was traced to the right side of the fundus of the uterus, to which part it was connected by means of a pedicle, two inches in breadth, and an inch and a half in length, formed by the fibres of the uterus, which were traced upwards some distance, and then lost. Among these fibres, were several vessels of a large size. Here and there, in the lower part of the tumour, were scattered some spots of fibrous tissue, hard, dense, and without any cysts. In the body of the uterus, deeply imbedded in its structure, there was a common fibrous tumour, of the size of a bean. There was no affection whatever of any of the glands. The other viscera contained in the abdomen, as well as those in the thorax, were all quite healthy.

Microscopic examination proved that the tumour was essentially of a fibrous character.

Remarks. Accumulations of fluid, in connection with Fibrous Tumours of the Uterus, may occur under various forms. As they present all the characters of ovarian dropsy very strongly marked, such cases are of great importance, for they have sometimes led to errors in diagnosis, and to useless operations; especially those cases in which the fluid is poured out into numerous small cysts.

The fluid is sometimes contained in a single cavity, formed by the softening and subsequent removal of the centre of the tumour, the place of which becomes filled up by serum. This, by gradually distending and thinning the outer part of the tumour, may make the disease appear as if it had been, from its origin, a cyst. The quantity of fluid contained in cavities thus formed may be very great.

In other cases there are several cysts containing fluid, which are produced in a different manner. Here, the cavities, lying between the fibres constituting the tumour, are generally towards its circumference, and that principally in cases where the mass, having grown more rapidly than usual, has acquired a large size. In a Fibrous Tumour of the Uterus, weighing fifty-four pounds, which I dissected some time ago, I found several cavities, which were all situated towards its circumference. Some of these were round, others of a semi-lunar shape—the latter appearing to have been the original shape of the greater number of the cysts. Their formation may be thus explained. The tumour was of a pear-like shape, and composed of layers of fibres, presenting a somewhat looped appearance. The extremities of these layers, being firmly con-

nected, formed a perfectly solid mass; whereas the centre of the loops, towards the circumference of the tumour, being but loosely connected by thin cellular tissue, had, in many places, left inter-laminar spaces, which had subsequently become filled with fluid. The cysts thus formed were of various sizes, and few in number; their cavities were perfectly smooth, and not subdivided by bands of cellular tissue.

There is another class of Fibrous Tumours, which appear to have been formed by the union of several smaller ones by means of loose cellular tissue, in the meshes of which, fluid has been thrown out, and has subsequently formed cavities or cysts. In these cases, the cavities, generally speaking, are not of any great size, and the mass looks like a large œdematous Fibrous Tumour. When punctured, but little fluid escapes from them; but, if incisions be made in several places, the greater part of the fluid will drain off in a few hours, leaving a coarse cavernous-looking tissue.

The Fibro-Cystic Tumour described in the case of M. G., cannot, I think, be looked upon as belonging to either of the three varieties already mentioned. From its earliest formation, the tumour was most probably of a fibro-cystic nature, and exactly resembled that form of disease so commonly observed in the ovary, which is composed of uni-locular cysts, of various sizes, closely aggregated together, with more or less delicate fibro-serous walls; in fact, so close was the resemblance, that for some time the mass was taken for a diseased ovary. Portions of it also closely resembled the simple cystic disease of the testis, as well as one form of fibro-cystic disease which I have met with in a large tumour of the breast. The accumulations of solid fibrous tissue observed in the case of M. G., were scattered, and small in comparison to the size of the tumour; whereas the mass of it was made up of cysts, which existed in every part, even close to the root.

ON THE CAUSES, CONSEQUENCES, AND TREATMENT OF INFLAMMATION OF THE VEINS:

WITH CASES ILLUSTRATING THE EFFECTS OF PURULENT INFECTION OF THE BLOOD.

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PART II.

(Concluded from page 240.)

VIII. The experiments cited in the first part of this essay, illustrate the power possessed by the blood of preventing certain foreign substances from circulating with it. They shew that pus, in particular, has a tendency to coagulate the blood; and that by this means, when introduced into the vessels, its progress is arrested in some part of the circulating system. This fact, which, taken by itself, might appear of little consequence, assumes considerable importance when considered as one of the inherent properties of the blood, at all times ready, under favourable circumstances, to be called into action in the living body.

The conditions under which pus will determine the coagulation of the blood, and those under which it will circulate in the living vessels, require to be accurately ascertained, in order to reconcile the discordant evidence which we at present have upon this point.

Dr. Sédillot,[1] in a work recently published, mentions, that a great number of cases are met with, in which pus is poured into the general circulation without meeting with any obstruction, and states that, in such instances, he can detect the globules of pus in different parts of the circulating system. He even affirms that he can recognise a disease caused by purulent infection, by examining, under a microscope, a portion of the blood abstracted from the body.

M. Dance, and, since his time, equally accurate observers, have, on the other hand, failed to detect the characters of pus in the blood, even when that fluid had been injected into the veins of living animals. The results of these different observations may perhaps be reconciled, by considering the influence exercised upon the globules of pus by the blood, before its coagulating power has been impaired. This subject appears not to have hitherto occupied the attention of pathologists.

In all the cases quoted by Dr. Sédillot, in which he detected the globules of pus in the blood, the patients had died of the disease; but in the researches instituted by M. Dance and others, the experiments were made upon animals in perfect health. In the latter, the pus cannot enter the circulation, as has already been shewn, or can only do so after the blood has partially or entirely coagulated round it, and the coagulum has subsequently become broken up.

In the act of coagulation under these circumstances, the appearances of the globules of pus are changed,—these being perhaps mechanically compressed by the contraction of the fibrine,—so that the most experienced eye can no longer recognise them.

Pus, mixed with healthy recently drawn blood, out of the body, will entirely lose its characters in this way; and as the coagulation, under similar circumstances, is by no means retarded in the living vessels, we may, without fear of contradiction, affirm, that globules of pus cannot be detected when introduced into the vessels in small quantities, and mixed with healthy blood.

In cases where, from long-continued disease and the repeated introduction of vitiated fluids into the circulation, the blood has lost its power, there appears no reason to doubt the correctness of Dr. Sédillot's observations; and it is probable that pus-globules may then circulate with those of the blood.

In experiments upon animals, it has always been found that the power of the constitution, in resisting the effects of the injection of pus into the veins, was much greater at the first than at any subsequent operation. This circumstance would appear to associate itself directly with the observations now made, and to afford another illustration of the power of healthy blood in resisting the entrance of some foreign matters into the system.

From the consideration of these facts, and of the experiments previously recorded, it becomes evident, that the introduction of pus into the

[1] De l'Infection Purulente, p. 399.

system through an injured or inflamed vein, can rarely be the first step towards purulent infection of the system. Some change must previously have passed in the blood, by which its coagulating power is impaired, or some unusual mechanical means must have been employed, before the pus can find its way in the course of the circulation. The contradictory statements which have been made by those who have injected pus into the veins, may thus be reconciled, by taking into account the power exercised by the blood in the experiments which have been made. There can be little doubt that, while, in some instances, a portion of the pus has been forced into the general circulation, in the great majority of cases it has been detained in the vein into which it was first introduced, and has never become part of the circulating fluid. We accordingly find some experimenters recording the secondary diseases which they observed, while in other hands these appearances were not produced.

Dr. Sédillot[1] has attempted to prove that the globules, or solid parts of pus, must be introduced into the system, in order to produce well-marked indications of purulent infection. But this hypothesis would not only appear to be at variance with the oft-repeated experiments of MM. Gaspard and Cruveilhier, in which similar effects were produced by the injection of mercury and of putrid fluids, but would also leave unexplained the mode of the introduction of these globules, where there is evidence of the disease originating through the lymphatic system. The changes which all substances undergo in their passage through the absorbent glands, would at once forbid the idea that globules of pus could be thus introduced unchanged into the circulation; and yet we have direct evidence (Case XXIX) of irritating fluids being conveyed in this way into the system, and leading to the formation of secondary abscesses.

Another class of cases, in which there would be difficulty in admitting the doctrine of the introduction of pus in substance into the circulation, presents itself, where, in the primary affections (as in Case VI), no evidence can be obtained of the original lesion having suppurated. The fluids effused in such cases may be serum, lymph, or blood, mixed in different proportions; and yet the constitutional symptoms will be exactly similar to those which follow the formation of pus in other cases. There may exist, both in the primary and in the secondary affection, every intermediate gradation between the healthy secretion of a part, and the formation of pure pus, or pus mixed with blood or lymph, without any of the essential characters of the disease being absent. An inflamed bursa, or a punctured wound, without the formation of pus, (Cases IV and V), may give rise to symptoms as severe, and consequences as fatal, as any that arise from the direct introduction of pus into the system. The secondary affections, in such cases, may run their course

[1] In deducing general conclusions from experiments upon animals, it must be borne in mind, that in them suppuration is induced with great difficulty. Many of the appearances produced by the injection of putrid fluids (as in Experiment XIV) would, in man, probably have terminated in suppuration. Dr. Sédillot has nevertheless established the fact, that, generally speaking, a different class of post-mortem appearances may be expected from the introduction of decomposed serum, to those produced from fluids containing solid particles.

and prove as speedily fatal, as where well-formed purulent deposits have taken place. The most severe constitutional symptoms will sometimes be followed by the effusion of bloody fluid only, in one of the serous cavities (Case xxx). It would be unphilosophical, even were it practicable, to refer such cases to a different disease, merely because the accidental circumstance of the formation of pus is wanting. The origin of the affection in such instances may be as well-marked, the poison can often be traced as distinctly into the system, and the secondary disease may be as clearly connected with the primary, as in any case where pus has been originally formed. In some cases again, the constitutional symptoms which accompany, or are followed by, effusions into distant parts of the body, begin before sufficient time has elapsed to allow the supposition that pus can have been fully formed at the original seat of injury. Such instances occasionally, although rarely, present themselves in extensive burns and scalds, occurring in enfeebled habits, and after amputation of the limbs in scrofulous children.

In nearly all cases, when the origin of the constitutional disease cannot be traced to the introduction of diseased fluid into the system through an open vein, it will be found that the part primarily injured has wanted the degree of vigour, requisite to establish and maintain healthy adhesive inflammation.

In the first part of this paper,[1] I have endeavoured to show that, where lymph is effused around a poisoned wound, the virus will find its way less easily along the absorbent vessels, than when no such effusion has taken place; and that when, in such a wound, the effusion of lymph is checked or prevented, as by the administration of mercury, a larger proportion of cases will indicate an affection of the lymphatic system, than when the natural process has not been interfered with. There can be little doubt, that the same principle may be observed with regard to ordinary wounds. The number of cases in which the absorbents inflame, will be in inverse proportion to the number of those in which the original wounds are circumscribed by healthy adhesive inflammation. In Case xxvii, it is mentioned, that the surface of a muscle, implicated in the original lesion, was as cleanly dissected as if with a scalpel, thus showing the total absence of any surrounding effusion of lymph. The absence of, or defect in, the process of adhesion may thus be associated with inflammation of the absorbents, as the want of "union by first intention" has been shown to be connected with inflammation of the veins (Section ii.)

The minuteness of the absorbent vessels, and the changes which their contents undergo in their glands, prevent any unhealthy fluids from being as readily recognised in them as in the veins. But when the progress of inflammation can be traced along these vessels from a wound, towards the centre of the circulation, marked, as it often is, at intervals, by the formation of abscesses, we cannot doubt that an irritating fluid has found its way along their canals: and when the constitutional symptoms, which arise at the same time, terminate in the formation of purulent deposits (as in Case xxix), we cannot but admit that the absorbent vessels are the direct means by which, in such cases,

[1] London Journal of Medicine, vol. i, p. 799.

diseased secretions are poured into the blood, and the system becomes infected. It would, therefore, appear that there are two principal conditions, under which local disease may produce a general infection of the system by the direct introduction of vitiated fluids into the blood. The first of these is connected with defective union in injured veins; the second is associated with want of healthy adhesion in inflamed lymphatics.

The period of invasion of the attack differs in some degree in the different classes of cases, but it is generally marked with great precision: even when apparent recovery has been followed by a second attack, the occurrence has in each instance been accurately noted by the sudden appearance of constitutional symptoms (see Case XXXVII).

When one of the large veins has been originally affected, the period which elapses before symptoms of infection of the system manifest themselves, is comparatively short (Case I). In cases occurring after child-birth, it is usually longer, extending to the end of the second week. After surgical operations or accidents involving some portion of bone, the access of the disease will be marked by a rigor during the third or fourth week; and finally, when the absorbent system is primarily affected, the period of the occurrence of the constitutional symptoms may be much farther removed from that of the original injury (if any such existed), and is by no means so accurately defined.

At the time of the occurrence of the general disturbance of the system, the local injury or wound will generally put on an unhealthy appearance. The skin in the immediate neighbourhood will sometimes assume a dull brownish-red appearance, which will gradually fade into the colour of the surrounding parts. This symptom will usually commence near the termination of those vessels, which are derived from the same trunk as those which supply the injured part. When the original injury is complicated with a wound upon the surface of the body, it will usually become dry and glazed, and the blush upon the skin will commence in its neighbourhood, or a short distance from it, and will usually extend towards the centre of the circulation, without presenting any very defined margin: occasionally it will extend, in the form of erratic erysipelas, over a large part of the body.[1]

IX. The commencement of constitutional disease, after direct infection of the blood, is marked by a sudden change in the manner and appearance of the patient; a severe rigor is usually the most prominent symptom, and is followed by much febrile excitement, or by extreme depression; a very peculiar heat of skin (Case XXII) will sometimes be present, while, at other times, the surface will be covered by a profuse clammy perspiration. The rigor may be repeated at irregular intervals, but occasionally it will recur about the same hour for three or four days in succession (Case XXXVII), and in a few instances it will not be observed at all.

Great depression frequently accompanies even the first stages of this disease, indicated by a want of tone in the pulse, by an extremely listless

[1] In a case of fracture of the femur into the knee-joint, I saw a dark ill-defined erysipelatous blush extend from the affected limb to the body, and thence to the head. Purulent deposits formed in various parts of the body, of which the patient died.

manner, and sometimes by a tendency to syncope (Case 1). The countenance becomes anxious, the tongue dry and brown in the centre, and red at the edges, or, in other instances, it presents a coating of a pasty yellowish-white colour; a dusky yellow hue frequently pervades the skin, and sometimes the conjunctivæ of the eyes. This may or may not depend upon an accompanying affection of the liver. The pulse varies much in frequency in different cases, and at different times in the same case: generally it is very rapid, especially when accompanied with much heat of skin.

The pain is sometimes severe, and may be referred exactly to the spot which subsequent examination shows to have been the seat of secondary inflammation; at other times it is not confined to any particular situation, but consists of general ill-defined feelings of short duration, and recurring at irregular intervals. The peculiarity of such sensations is best expressed by the terms applied to them by the patients themselves. "Catching pains all over", "soreness of the stomach", and "thrilling in the blood", not unfrequently accompany this disease.

Vomiting may occur, either as a symptom of constitutional disturbance, or as indicative of inflammation of an abdominal organ (Case XXVI). In the latter case, it is extremely obstinate, and the fluid ejected is generally of a green colour. Diarrhœa is a symptom of frequent occurrence, and appears to exercise a considerable influence on the course of the disease. Its appearance will not unfrequently be accompanied by relief of the other symptoms (Case III); when it occurs, it is generally profuse, and little under the control of medicine, but, if checked, may be followed by a sudden change for the worse in the condition of the patient.

The intellect is seldom affected during the first stages of the complaint; but subsequently, in severe cases, restlessness, delirium, and coma, seldom fail to succeed each other. These symptoms are all peculiar, both in regard to the rapidity with which they make their appearance, and also the sudden manner in which they occasionally disappear. The disease may seem, within a few hours, to leave a part which it has first attacked, and to fall upon a different organ in some remote part of the body.

X. The post-mortem appearances observed in those who die in consequence of the introduction of vitiated fluids into the blood, cannot, for the most part, be distinguished from similar changes produced by other causes; yet there are some effects which are peculiar, and may be directly associated with the reception of foreign matter into the circulation. The most characteristic circumstance, attending the extension of disease to different organs of the body through the medium of the blood, is that several parts of these organs, or even different organs, will be simultaneously attacked. The disease will appear at once in various spots, which will become rapidly disorganized, while the surrounding textures will remain unaltered, either in structure or colour. The appearances observed upon dissection will vary according to the part attacked, and the stage of development in which the disease is found.

The lungs are the organs in which the successive changes may best be observed. When puriform fluid has entered the circulation,

the first appearance produced in the structure of the lungs, is that of one or more congested or dilated veins[1] of very small diameter. This will be followed by a well defined spot, of much darker colour than the surrounding texture (see Plate, facing p. 624.) Several of these spots will probably appear at the same time, and each one of them will soon become surrounded by a hard spherical patch of purple congestion. Effusion of lymph will now take place, commencing in the centre of each affected portion, and gradually extending towards its circumference. If the disease continue, each spot will suppurate, and the different parts will become softened and broken down, in the same order in which they were previously solidified.

The liver frequently becomes the seat of secondary inflammation. In the early stage, brownish-red spots may be observed scattered through its substance. These, as they extend, assume a bluish or slate colour; and the structure of the liver thus affected is found to have lost its consistence, and to be very easily broken down by pressure. Every part affected here, as in the lungs, proceeds rapidly to suppuration; and the usual appearance presented after death, is that of several small circumscribed abscesses, around which the structure of the liver has been condensed only to a very small extent. It sometimes happens, that the larger veins in the liver become inflamed. These vessels, being held open by the firm structure of the part, are not so readily obliterated as in other situations; and it consequently happens, that the lymph and pus poured into them become irregularly mixed with the blood, more or less perfectly coagulated, which they contain: a very peculiar mottled appearance, resembling granite, is thus occasionally produced.

Affections of the spleen, produced by the introduction of foreign matter into the blood, are probably not so readily recognised as similar affections in the lungs and liver. For, although the spleen is often found to be diseased in those who die from infection of the blood, yet it is comparatively seldom that secondary abscesses have been found in it. In the accompanying table, containing twenty-three cases, some morbid appearance, not recognised as peculiarly the result of secondary inflammation, was observed in the spleen in no less than eight instances. So large a proportion of cases renders it probable, that the alterations observed have more than an accidental connexion with the disease of which the patient died, although they presented no characters which could be said to be peculiar to that disease. In well-marked cases of secondary affections of the spleen, one or more well defined, but frequently irregular indurations, of a chocolate colour, may be recognised; such patches are usually seen soon after the commencement of the complaint, and very soon become softened or broken down. The rapidity with which they lose their original character, may probably account for their being comparatively seldom observed in post-mortem examinations.

Deposits of lymph are sometimes met with in the kidneys; but these are of small extent, of a light colour, and resemble lymph deposited in consequence of ordinary inflammation. The patches of congestion, so characteristic of this disease in other organs, are not here observed.

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[1] For the knowledge of this fact, I am indebted to Mr. Cæsar Hawkins, of St. George's Hospital.

This may depend upon the peculiar disposition of the capillary system of the kidney. The blood has to pass through the Malpighian tufts, and may be purified, or altered in character, before it reaches the proper venous system of the organ.

In cases where purulent infection of the blood has been purposely produced, portions of the kidney will not unfrequently be found inflamed and firmer than natural; but, if the origin of the disease were not known, these appearances could not be distinguished from those produced by inflammation of the kidney from other causes.

The skin is liable to be affected in three different forms. (See Cases I, II, III, IX, X, and XXXIV.) The first of these occurs very rarely, and consists of small deposits of matter in the structure, or upon the surface of the skin, resembling in many respects the pustules of small-pox. The second form is also of rare occurrence, and consists of small congested spots on the surface of the skin. These are generally of a dark purple hue, but I have seen one case in which they were of a bright red colour. In this instance, a secondary abscess had formed in the knee-joint, and some pustules appeared upon the skin in the neighbourhood. A fortnight before the death of the patient, a number of small bright red spots made their appearance in different parts of the thigh and upper part of the leg; some of these were three or four lines in diameter, while others were so small as not to be seen without attention; they appeared in accurately defined spots, of a brighter colour than the mucous membrane of the lips, and continued unchanged in appearance till death. The third form presents itself much more frequently than either of the others, although it has not hitherto much attracted the attention of pathologists, in connexion with purulent or other infection of the blood. It commences very suddenly, and frequently without any particular attention being directed to the part. A large circular patch of congestion, livid or purple in the centre, but becoming of a lighter colour towards the circumference, will form, usually upon some part of the lower extremities. The skin of the calf of the leg is perhaps more frequently attacked than that of any other part. In the centre of the congested portion, mortification very rapidly takes place, and is indicated by the part assuming a black or dull leaden colour. In some cases, it would be difficult to say where the mortification ceases, and the congestion begins; but in other instances, there is a distinct line of demarcation formed: a zone of bright red congestion will then occasionally surround the mortified part.

Some modifications of this third form of affection of the skin may be met with occasionally in the course of the disease. Blotches assuming a livid or dusky red appearance (which gradually fades into the colour of the surrounding skin), will present themselves in different parts (Case XXXVI). In some instances, the superficial portions only of the skin are destroyed, and the parts beneath appear comparatively unaffected; small circumscribed portions of the outer layer of the skin will exfoliate, and the subjacent parts will heal without suppuration, by a process similar to that of scabbing (Case III).

It is remarkable in this disease, that the most vascular parts are those which soonest lose their vitality. Thus, in the case last referred to, portions of the surface of the skin perished, while the deeper layers

recovered; again, it is not unusual to observe the whole thickness of the skin destroyed, without any corresponding affection of the cellular membrane beneath. The quantity of blood sent to a part would thus appear to favour mortification in this disease. The reason of this peculiarity will be considered in the next section.

In two of the instances recorded in the Appendix (Cases XXII and XXVI), the lining membrane of the rectum was found of a very dark colour, and in one it had assumed a greenish appearance. This discoloration was at first looked upon as some accidental complication, or as depending upon previous disease. But M. Gaspard has noticed a similar condition, after the artificial introduction of putrid fluid into the blood.[1] In one of the experiments referred to, the mucous membrane of the intestines was everywhere healthy, except in the *rectum* and *duodenum*. In the former situation, the rugæ were prominent, and of a violet colour; in the latter, the membrane was of the colour of pale lees of wine. From the coincidence thus observed, we are led to believe that the same condition which produces congestion in the skin, may produce an analogous affection of the mucous membrane. Nor must we omit to note, in connexion with this subject, the fact of the mucous membrane of the vagina being occasionally found of a dark purple colour in those who die of puerperal affections.

In the cellular membrane, serum, lymph, and pus, may be deposited, mixed with each other in various proportions. The surrounding vascularity, in these cases, is unusually small, and the lymph effused not properly organized; there is, consequently, no natural boundary to the disorganizing process, and the fluid secreted becomes infiltrated in the surrounding parts.

When the muscular structure is affected, suppuration takes place with great rapidity; portions of muscles may be found quite soft, and sometimes pultaceous, in circumscribed patches, around which the fibre is perfectly healthy. Pus is occasionally deposited on the exterior of muscles; and it will be then smeared over the surface, and rather infiltrated in the cellular tissue, than contained in a cyst. In the interior of muscles, there is the same absence of the natural limit to the inflammation; but, owing to the more compact structure of the part, the deposits of matter generally remain circumscribed.

The brain and its membranes frequently present diseased appearances in those who die from secondary inflammation; these, for the most part, may be altogether independent of any peculiar effects of the disease; but, in some cases, it appears probable that they are not altogether unconnected with it. In one of the accompanying cases, the *pons Varolii* and *medulla oblongata* were found of a pink colour, in consequence of congestion, where the system had become contaminated by the absorption of diseased secretion; and, in another, a layer of purulent lymph was found within the cavity of the arachnoid, accompanied by marks of inflammatory action in the fourth, and in one of the lateral ventricles.

The serous membranes are peculiarly liable to be attacked by secondary inflammation; and, when affected, suppurate with the greatest readi-

[1] Journal de Physiologie, t. iv, p. 45.

ness. They generally exhibit but a slight degree of vascularity, and sometimes scarcely appear more injected than in their natural condition. In the peritoneal cavity, large quantities of unorganised lymph are frequently poured out, mixed with turbid serum or pus. The synovial membranes of joints, when affected, appear to run directly into suppuration, and will become distended with pus in a very short space of time. The pleura, on the other hand, will seldom suppurate at first; but lymph will be deposited upon its surface, and its cavity will contain turbid serum, occasionally mixed with blood.

XI. In the first sections, the changes produced in the blood, both in and out of the body, by the admixture of purulent or diseased secretions, were considered; and, in the last section, the post-mortem appearances observed in the different organs of those who have died in consequence of secondary inflammations, have been described. It now remains to connect these two series of observations, and to trace the relation that they bear to each other.

The most direct way in which diseased blood produces disease in the parts to which it is conveyed, is by communicating to them its own condition. Even foreign substances, which have no natural connexion with the body, may, in this way, be conveyed in the blood, and deposited in the organs of the body. Hunter relates a case,[1] in which a house-painter, who had been paralytic in his hands and legs for a considerable time, had his thigh broken, and died, about three weeks after, of the accident: "On examining the body, after death, the muscles, particularly those of the arms, had lost their natural colour; but, instead of being ligamentous and semitransparent, as happens in common paralysis, they were opaque, resembling exactly in appearance parts steeped in a solution of Goulard's extract. From this case it appears, that the lead had been evidently carried along with the blood into the muscles themselves. The blood can thus receive and retain extraneous matter capable of destroying the solids."

If foreign matter may, in this way, be conveyed to different parts of the frame, and there produce its chemical effects, it will readily be admitted, that a mechanical or vital action commenced in the blood,[2] may be continued in it when moved to a different part of the body.

In those who die of secondary inflammations, the result of such actions may frequently be traced from the seat of the primary injury even to the heart itself; and, as it has already been shown that contaminated blood will communicate morbid action to the vessels in which it is contained (section III), there no longer remains any difficulty in accounting for the sudden way in which this disease may fall upon a particular organ, or the unexpected manner in which the symptoms may shift from one part of the body to another. The conditions of the blood, which may be observed upon dissection, in this disease, so far as they tend to illustrate the present subject, may be included in two general expressions: 1st, those in which the blood has had a preternatural tendency to coagulate impressed upon it; and, 2nd, those in

[1] Op. cit. p. 99.

[2] It may appear unusual to speak of action going on in the blood; but, in so doing, we only illustrate the principle with which we commenced, viz., that "the blood has the power of action within itself."

which its coagulating power has, to a greater or less extent, been impaired. In one case, the blood is generally found of a dark colour, with firm, and sometimes adherent coagula in the vessels; in the other, it is thin and fluid.

When a preternatural tendency to coagulate has been impressed upon the blood, it will lodge in different parts of the vascular system, in situations which are most favourable to such an action; when, on the contrary, it has lost its coagulating power, extensive effusions may be expected, and the symptoms included under the term "gangrenous diathesis" will generally manifest themselves.

As the aggregate diameter of the vessels in the body decreases, the blood in them flows with greater rapidity and force; and when near the heart, it is placed in circumstances unfavourable to coagulation, in consequence of the rapid motion there communicated to it; and we accordingly find that, although adherent coagula may be formed in the veins leading from the seat of injury, and may be traced thence through other larger vessels, they will usually terminate abruptly, when these open into the vena cava. But when the blood arrives in the cavities of the heart, the tendency to coagulate may again manifest itself. Diseased coagula, presenting a "mottled appearance, partly brown, and partly of a dirty yellow colour", or "dark coloured, and partly composed of a yellowish grey opaque substance", or "with portions inelastic, and of an opaque yellow colour", will be found entangled among the projecting fibres of the auricles and ventricles. In the arteries, the blood is in the most unfavourable circumstances for coagulation during life, in consequence of the comparative smallness of their diameters, and the succession of impulses communicated to their contents; but even here, diseased and adherent coagula may be found in cases of secondary inflammations.

M. Cruveilhier[1] relates an instance in which, after child-birth, the pulmonary artery was found filled with coagula following its divisions. The principal clot had lost its colour, and was *adherent* to the sides of the vessel, and contained in its centre puriform fluid.

In another case, following the operation for necrosis, the following post-mortem appearances were observed. The left lung presented, in several places, patches of red hepatization, perfectly defined, and resembling so many spots of lobular inflammation. When cut into, these patches presented several puncta of puriform fluid. The *veins* of the lung contained fibrinous-looking coagula blocking up their cavities; and in the centre of these coagula was a whitish purulent looking fluid.

The diseased condition of the blood may thus be traced visibly from the original wound, through the larger vessels, to the heart, and again from the heart to the capillary system. The disposition to coagulate, once impressed upon the blood, is not destroyed by that fluid being conveyed to a different part of the body: the action may be retarded by motion in, as well as out of the body, but will nevertheless occur when it is placed under more favourable circumstances.

These circumstances, in the living vessels, are when the blood becomes separated into small quantities, and when it moves slowly

[1] Op. cit. p. 669.

along the capillaries. The blood will then coagulate in circumscribed patches,[1] as illustrated in the first characteristic marks of secondary disease which have already been mentioned as occurring in the lungs, the liver, the spleen, and the skin. The accompanying plate is taken from the lung of a donkey in which purulent fluid had been made to circulate with the blood. The stagnation of the blood, when the pus was first introduced, was mechanically prevented, and the livid spots produced by its subsequent coagulation in the capillaries of the lungs has been very faithfully represented. (See Experiment No. VI.)

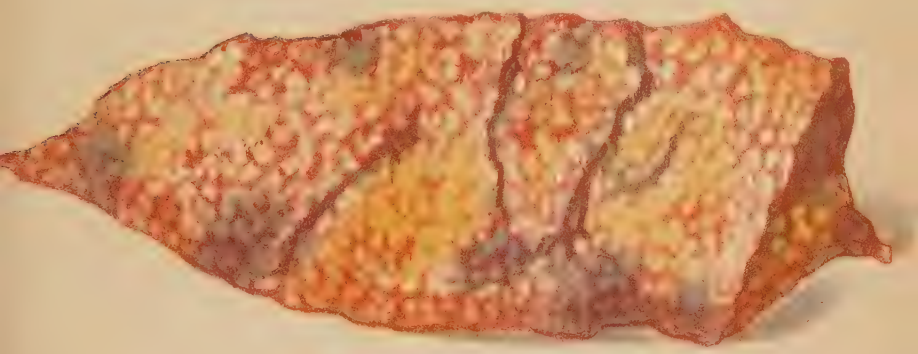
"Besides the disposition for coagulation," observes Mr. Hunter, "the blood has, under certain circumstances, a disposition for the separation of the red globules, and probably of all its parts; for I have reason to believe, that a disposition for a separation of the red part and coagulation, are not the same thing, but arise from two different principles. This is always observable in bleeding; for if we tie up an arm and do not bleed immediately, the first blood that flows from the orifice, or that which has stagnated for some time in the veins, will soonest separate into its three constituent parts: this circumstance exposes more of the coagulating lymph at the top, which is supposed by the ignorant to indicate more inflammation, while the next quantity taken suspends its red parts in the lymph, and gives the idea that the first small quantity had been of such service at the time of its flowing, as to have altered for the better the whole mass of blood. Rest, therefore, may be regarded as one of the immediate causes of the separation." *Hunter*, p. 29.

This disposition of the blood to separate into its constituent parts is evinced in a very marked degree in one class of secondary affections. Extensive effusions of serum, lymph, and pus, mixed in different proportions, will take place in the serous cavities of the body, and become infiltrated in the cellular membrane, accompanied with very little vascular action in the parts. The colouring matter of the blood will also sometimes become effused with its other parts; but when this is the case, they will be found to have lost altogether the power of coagulation: in this respect presenting a direct contrast to the blood effused from a healthy wounded vessel. The lymph deposited will be found lying in unorganized flakes, wanting its usual adhesive properties, and very slightly attached to parts, presenting little or no increased vascularity. The rapid manner in which these effusions take place, shows that they are separated from the blood without undergoing any very elaborate process. In this condition of the system, any organ upon which the disease falls, may rapidly become disorganized and will readily mortify, and, after death, a tendency to rapid decomposition will be manifested. The veins on the surface of the body may frequently be traced as dark blue lines, as though the skin covering them were stained by the colouring matter of the blood. The lungs and other organs may, under these circumstances, be found in every grade of disorganization, till they present all the characteristics of gangrene: even the peculiar fetor which accompanies mortification of the lung, will, in some instances, be pre-

[1] The term ecchymosis does not appear appropriate to the discoloured condition of parts observed in the commencement of this disease; the blood is not at first extravasated from the vessels, as the term frequently employed would indicate.

PLATE SHEWING THE FIRST MORBID APPEARANCE PRODUCED
BY THE STAGNATION OF VITIATED BLOOD IN THE CAPILLARIES OF THE LUNGS.

Surface of Lung with Pleura removed.



DR WESTMACOTT AD NATM PINXT OCTR 1845.

sent. In this condition may also be observed a tendency to the formation of petechial spots in different parts; and even the organs which do not appear to have been the peculiar seat of the disease, will be found to have lost their consistency, and to break down upon comparatively slight pressure.

Mr. Hunter found, that in proportion as the blood retained the power of coagulation, it had the power of resisting putrefaction; and conversely, we observe that, in this class of cases, the deficiency of the former is accompanied in a marked manner with the absence of the latter.

The two conditions of the blood which have now been mentioned, appear to bear a direct relation to the two classes of post-mortem appearances, observed in cases of secondary inflammations: the first being generally connected with congestion of different organs during the first stages of the disease, the second with extensive effusions, accompanied with comparatively little vascularity.

XII. The treatment of secondary inflammations naturally divides itself into local and constitutional, both as regards the primary lesion and the subsequent affections. The circumstances which interfere with union by the first intention in veins, have been shown to be the same as those which precede the formation of purulent deposits, in a large class of cases. Whatever then tends to favour the healthy reparation of a wounded vein, may be regarded as affording security against any subsequent disease; but the chief point in the local treatment is, perhaps, to prevent any accidental circumstances from interfering with the natural process of repair. When the powers of the constitution are enfeebled, even the natural motions of a part may interfere with recovery, and rest sometimes becomes an important object in the treatment. How necessary this is after child-birth, when the divided veins are being closed, every one who has attended such cases practically knows.

Again, after bleeding, the arm will inflame in a much greater proportion of cases, when the patient is obliged to follow his usual occupation, or when, from accidental circumstances (as from the pain experienced in Case I), the arms are kept in motion. It has occurred to me, to see the symptoms of purulent deposits set in, on the day following prolonged attempts to bring fractured portions of bone into position. In all such cases, any external violence (as in Experiment No. VI), or even the motion of the body, as in Dr. Davis's case (section IV) may loosen the coagula formed, either between the wounded edges, or in the cavities of veins. In the treatment of the local injury, a valuable hint has been left us by Mr. Hunter, connected directly with the consideration of the pathology of the disease. "The way in which sore arms after bleeding come on, shows plainly that they arise from the wound not healing by the first intention"; and he recommends that the two sides of the vein should be approximated by a compress, until union of the divided edges has taken place.

It has been shown upon very high authority, that the sides of a vein do not unite after venesection (as has sometimes been presumed to be Mr. Hunter's opinion); but that the divided edges only of the vessel are agglutinated by the coagulum, which "serves as a bed to the new

membrane." But the case is different, should this first attempt at union fail; the sides of the vessel may then become united, and its cavity for a time obstructed (section IV). The approximation of the sides of the veins would materially facilitate this action, which is the natural security, under the circumstances, against the admission of foreign matter. When an abscess is suspected to have formed in a vein, a similar mode of treatment is recommended by Hunter; the compression, in this case, being placed between the inflamed part and the centre of the circulation. In the pathological museum of the College of Surgeons, one of Mr. Hunter's preparations (No. 1728) exhibits such a case, where, from the imperfect union of a vein, the contents of the abscess had become mixed with the blood.

As the process of reparation has been variously described by authors, so the different theories propounded have led to different kinds of treatment. At the Veterinary College, even within the last few years, it was publicly taught, that a coagulum in a vein was a foreign substance, and ought to be removed; and the jugular vein in horses which had been bled, was sometimes slit up for several inches, in order to remove the coagula which formed in successive portions of its course.

That a coagulum in a vein may be an irritating substance has been fully proved (sections I and II); but the irritation depends upon the accidental admixture of foreign matter: and the process that consequently takes place requires to be carefully distinguished from the natural mode of union by the first intention.

To remove coagula which have formed round purulent secretion (if such could be recognised), might be to remove a cause of irritation; but to remove them in ordinary cases, is to remove the very means prepared by nature for the restoration and safety of the part. In operations involving large vessels, the local conditions which may influence the actions in the veins, appear not to have been fully determined; for while some surgeons regard the tying or cutting of a vein as a serious operation, others are in the constant habit of doing it with impunity. In operations upon hæmorrhoidal tumours, the veins involved are of some size, and in two of the instances recorded in the Appendix, a ligature applied to them was followed by purulent deposits. In the usual operation of passing a needle armed with a double ligature through the base of such a tumour, the hæmorrhoidal veins are necessarily sometimes wounded, and there is danger that, in tying the ligatures, the sides of a wounded vein may be drawn asunder. The vessel may thus be held open, and be in a similar condition to the vessels contained in bony structures.

A safe way of performing this operation, when admissible, is to destroy a portion of the mucous membrane with strong nitric acid. The blood in the vessels then becomes charred, and their cavities obstructed, till they are permanently closed by adhesive inflammation. Every means of treating a local injury which tends to produce healthy union or adhesion, may be considered in some sort as a preventive mode of treatment. Position, topical applications, bandages, and temperature, may all have their influence in producing these healthy actions; but, as the wounds which precede purulent deposits are generally characterized by feeble powers, those conditions which tend to invigorate

the parts are principally indicated. "When action is greater than strength, whatever has the tendency to raise the power above irritability should be used: the object of this practice consists in bringing the strength of the constitution and parts as near upon a par with the action as possible, by which means, a kindly resolution or suppuration may take place, according as the parts are capable of acting." The irritability of a wound frequently appears nothing else than a series of attempts to bring about an action, which it has not the power to accomplish: as soon as that is fulfilled, which the necessity of the parts demands for their healthy condition, irritation will cease. In such cases, everything that will confer strength to carry out the intended action, will prevent inflammation. But no local applications will be sufficient to produce this effect, unless the powers of the constitution are supported at the same time.

A heavy man received a wound in the back of his head from an iron spike; he was kept very low, complaining occasionally of want of food. Repeated hæmorrhage took place at intervals of a day or two, which no local applications could suppress, and he ultimately died from loss of blood. The wound was found to extend through the bone into the lateral sinus, which contained only some fluid blood. No inflammatory action had taken place within the skull.

The constitutional treatment of wounds, liable to be succeeded by purulent deposits, is most important; for during the healing of the primary wound, the system may be influenced by remedies, which may be subsequently quite useless. It is evident, observes M. Cruveilhier,[1] that the treatment of phlebitis ought to be concentrated on the first period of the disease, viz., that of the coagulation of the blood; for as soon as pus has become mixed with the circulating blood, medicine is generally of no avail. When there are indications of the extension of inflammation along a vein, the mode of treatment usually adopted in this country has been the administration of calomel and opium; and, in France, general bleeding, but especially the application of large numbers of leeches. "We may subdue inflammation of veins, whatever their situation, by general blood-letting, and especially by local bleeding, repeatedly sufficiently often and in sufficient quantities!"[2] It is true that patients recover after such treatment; but the published records of cases not unfrequently terminate with such a description as the following: "The patient was repeatedly bled, and with apparent relief every time, the blood being extremely sizy. *Two days, however, previous to death, the vital principle was so exhausted as to need the use of cordials!!*"

If the explanation of the mode of adhesion in veins already given be correct, neither the propriety of bleeding, nor of the administration of mercury, as a rule, derives much support from a consideration of the pathology of the disease. Careful comparative experience is required, before either of these plans can be adopted as a recognised mode of treatment. Satisfactory evidence in favour of the employment of these remedies is still wanting; and, indeed, the numerical evidence which we have in some instances, tends to indicate an opposite plan of treatment.

[1] Op. cit. p. 662.

[2] Ibid.

At a period when puerperal fever was rife, forty cases, attacked with some form of the disease, "were treated without any bleeding or leeching, or without any attempt to induce the constitutional effects of mercury; and of these, only two died."[1] "In irritable habits, when the inflammation becomes more diffused," says Mr. Hunter, "bleeding should be performed with great caution: even a quick, hard pulse, and sizy blood, are not always to be depended upon as sure indications of bleeding being the proper method of the resolution of the inflammation; more must be taken into the account. The kind of blood is of great consequence to be known; for although it should prove sizy, yet if it lies squat in the basin, and is not firm in texture, and if the symptoms at the same time are very violent, bleeding must be performed very sparingly, if at all; for I suspect, that under such a state of blood, if the symptoms continue, bleeding is not the proper mode of treatment. If we had medicines which, when given internally, could be taken into the constitution, and were endowed with a power of making the vessels contract, such, I apprehend, would be proper medicines. Bark has certainly this property, and is of singular service, I believe, in every inflammation attended with weakness; and therefore, I conceive, should be oftener given than is commonly done."

In bleeding women suffering from puerperal fever during an epidemic, in which the disease frequently terminated in purulent deposits, I have frequently seen an irregular transparent bluish layer form upon the surface of the blood, almost immediately after the operation; in consequence of this, a repetition of the bleeding was sometimes had recourse to, when the subsequent stages of the disease appeared to indicate that it had not been required. The transparent layer of lymph on the surface of the blood, may, in such instances, be only an indication of its tendency to separate into its different parts, as previously described. Large bleedings, under such circumstances, inasmuch as they tend to diminish the already enfeebled power of coagulation in the blood, may predispose to the infection of the system, and to the formation of purulent deposits. The action of mercury upon the system, as illustrated in Case XXVI, may have the same tendency.

The action of mercury, so far as it can be traced upon the surface of the body, is certainly unfavourable both to union by the first intention, and to adhesive inflammation; and, inasmuch as the safety of the patient depends upon the due performance of these processes after an injury or wound, its effect upon the system must be regarded as of at least doubtful advantage.

When salivation has been induced, serum is poured out, and the texture of the gums is loosened and rendered spongy. When lymph is effused upon the iris, the action of mercury loosens its adhesions, and dissolves its connexions; it cannot, therefore, be supposed that its action upon the system should render the union of divided vessels stronger, or the newly-formed adhesions in wounds firmer. The cases in which purulent deposits usually form, indicate a debilitated state of constitution. They are of much more frequent occurrence in large towns than in the country, and in hospital than in private practice. The de-

[1] FERGUSON (Dr.) On the Diseases of Women. These cases formed one-fifth of the whole number treated.

pressing influences which they give to erysipelas, or puerperal fever, will also predispose to the formation of these abscesses; and as scanty diet, loss of blood, debilitating surgical operations, and over-crowded rooms, have been found among the causes of the former, so may they be looked upon as favouring the production of the latter. The Treatment of Inflammation of the Veins, in which purulent deposits frequently originate, is thus spoken of, from the result of lengthened observation: "All the experience that I have had on the subject, would lead me to believe that, like erysipelas, it has its origin in a low asthenic state of the system, and that those persons are especially liable to it, who have been much lowered by hæmorrhage at the time of an operation, or by too scanty a diet afterwards. An operation is a shock upon the system, making a great demand upon the vital powers. The effects of this shock are often much aggravated by loss of blood, and a very scanty diet actually makes the patient more liable to some kinds of inflammation. Our mode of practice ought to be rather to sustain his powers by allowing him wholesome nourishment, and not to add to the influence of the other depressing causes, the still worse one of starvation."[1] But as there are many circumstances, besides mere debility, which tend to produce a depressing effect upon the vital powers, so tonic medicines, and a generous diet, must not be looked upon as the only preventive modes of treatment. Each case that occurs in practice may present some peculiarity; in one case, the patient will be found to have previously suffered from diabetes; in another, from disease of the spleen; and in a third, from organic disease of the kidney; and, in each of these, a peculiar mode of treatment may be required. The general treatment of this disease, after the formation of purulent deposits has commenced, is probably as little satisfactory as any that come under the notice of the surgeon. The whole character of the affection is characterized by what has been aptly designated as action without power. The excitement of the system will imitate all the acts of genuine inflammation, without any of its healthy results; and loss of energy will appear immediately after, or even arise in conjunction with, the first symptoms of increased action.

In the treatment of such deposits, it must be borne in mind, that they are not the disease, but the effects of a concealed cause, which may develope itself in any part of the system; and that, while the relief of one organ is sought by depletion, additional vigour may be given to the latent evil, so as to render it more ready to develope itself in some other part. When purulent deposits occur, the sudden congestions, which indicate their commencement, are not accompanied by any reparative actions, and the lymph, which is effused in the subsequent stages of their formation, is not so disposed as to circumscribe and limit the inflammation; there is, therefore, no natural process by means of which such collections of fluid can be evacuated; hence, when situated near the surface, they should be opened as soon as they are detected. It will sometimes happen, that, after the symptoms of secondary inflammation of internal organs have commenced, an abscess will present itself near the surface of the body, and relief will be afforded to the part first affected; at other times, an obstinate and violent diarrhœa will precede

[1] Brodie (Sir B. C.) Medical Gazette, vol. xxxvii, p. 642.

recovery. Although the mode of treatment adopted may have little influence either in bringing on, or checking, such salutary actions, it is important to watch their occurrence, and perhaps still more important, to be careful not to mistake a remedial action for a symptom of the disease.

"What treatment," says Cruveilhier, "shall we oppose to purulent infection? To this question experience is as yet dumb, while theory would seem to point to diffusible stimuli and tonics; to ammonia, quinine, and sudorifics; to hot external applications, to the vapour baths, to purgatives, and especially to emetics; to tartarized antimony, in large doses; to vesicatories, and to strong diuretics. Calomel has been extensively employed, to create a fluxion from the intestinal mucous membrane; but all these means have failed as signally in my hands as in those of others; yet, when the injection of putrid matters into the veins of living animals has been followed by abundant and very fetid evacuations, they have usually got well. It is a fundamental fact of pathology, that the intestinal canal is chiefly affected in diseases caused by miasmata. I am certain that diseases resulting from purulent infection would not be stamped with the seal of incurability, and that nature, seconded by art, would triumph in the majority of cases, if the pus, which is incessantly renewed, did not incessantly renew the sources of infection. As soon as constitutional symptoms manifest themselves, neither general nor local bleeding affords any advantage. A portion of the *materies morbi* is, no doubt, abstracted with the blood; but, as it is constantly being reproduced, the constitution is only deprived of the power it would otherwise have of resisting the disease."[1] In accordance with this remark, M. Gaspard found that animals, which recovered after the injection of a certain quantity of pus into their veins, often died when the experiment was repeated. The recovery was usually preceded by black, liquid, and extremely fetid evacuations, which often seemed to afford immediate relief. When such evacuations have taken place in other diseases, the gall-bladder has been found distended with black bile;[2] and it appears probable that the liver, in these cases, is one of the principal organs through which the cleansing of the system is attempted. If the supply of morbid matter to the system could be checked, mercurial action, in this stage of the disease, might be of service, by enabling the liver, or other organs, to throw off their vitiated secretions. When patients recover from purulent deposits (Cases III and XXVII), they are often left in a debilitated and languid state, in which ordinary tonics exercise little influence. The consequences of the disease appear to hang about the system, long after the cause which gave rise to it has ceased. The pulse will sometimes continue irritable, and there will be a tendency to derangement of the secretions of the skin, bowels, and other organs, accompanied by occasional slight attacks of fever. In this condition, an alterative course of mercury, combined with sarsaparilla, has been found beneficial. These remedies, by stimulating the activity of the excreting organs, may assist the constitution in throwing off the disease; and their mode of action may be the same as in other cases, where the system has been infected by an animal poison.

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[1] Op. cit p. 662.

[2] I have observed this condition after injuries of the spine which proved fatal, by causing inflammation of other parts.

APPENDIX OF CASES.

A. CASES OF SECONDARY INFLAMMATION, ACCOMPANIED BY MORTIFICATION OF THE SKIN.

Case I. William Ford, 33, an apparently healthy man, was seized with the symptom of strangulated hernia, at Harrow, December 28th. He was bled in both arms; but, as the hernia remained unreduced, he was sent to town, in a state of considerable restlessness and suffering. During his journey, the hernia returned of its own accord. He left quite relieved, and remained well till the 31st, when he had a rigor. On the 1st of February, there was a considerable degree of febrile excitement, and the anterior part of the left arm was red, swollen, and painful upon pressure. The tenderness and pain soon extended up the arm, in the course of the cephalic vein: the redness assumed the character of erysipelas. On the 3rd, he suffered from sickness, the matter vomited being green and acid. He had two severe rigors, followed by great heat of skin, and a quick full pulse. The orifice in the left arm discharged a thin serous fluid. On the 4th, he complained of stiffness in the right arm; also of being very feeble and faint. 5th. Wandered much during the night. The right arm was a good deal swollen about the end of the elbow-joint, and presented a patch of a bright red colour above the condyle. The pulse was weak and tremulous; motions of the hands was occasionally observed. He complained of pain in the ring-finger of the right hand, and in the ball of the right great toe. The skin, in both these situations, had assumed a red appearance. 6th. Was delirious during the greater part of the night; countenance expressive of much anxiety; pulse very weak; tongue covered by a brown dry fur; profuse perspiration; complained of severe pain in the calves of his legs. He died during the following night.

Post-mortem appearances. A small deposit of thick pus was found on the external surface of the left cephalic vein. The blood was coagulated in its cavity, its coats were thickened, and its lining membrane appeared very red. This redness could be traced, though in a less degree, through the whole extent of the vena innominata. On the right side, the cellular tissue, both above and below the elbow-joint, was greatly distended with serum. The cephalic vein of the right arm presented marks of having been inflamed; but not nearly to the same extent as upon the opposite side. The joints in which pain had been experienced during life, were distended with turbid pus; deposits of pus were also found in the anterior mediastinum, and between the œsophagus and trachea. A large gangrenous spot was observed in the skin of the calf of the right leg. The subjacent cellular tissue was much distended with serum.

Case II. Richard Mason had a small cancerous tumour removed from the lower lip. The operation was performed in the usual way, and the wound appeared to heal by the first intention; a small abscess, however, followed by some ulceration, subsequently appeared in the neighbourhood of the cicatrix. Nine days after the operation, he complained of sore throat and general uneasiness, and three days afterwards he was seized with rigors, followed by cold perspiration and coma.

Post-mortem appearances. A small deposit of matter was found,

situated beneath the fascia of the left thigh. The synovial membrane of the left knee was highly inflamed, and contained a large quantity of pus. On the right side, the skin of the whole inferior extremity presented a dark livid appearance, with the exception of that situated upon the fore part of the thigh. The same dark colour was observed in the muscles of the limb, which were infiltrated with blood and serum. The arteries and veins were discoloured, but in other respects presented nothing remarkable. It was ascertained, that, two years previously, this patient had suffered from diabetes; and upon examining the urine found in the bladder, it was found to contain sugar.

Case III. Jane Thornton, æt. 32, came under treatment on the 22nd of March. A week previously, her right ancle had become red and painful, and inflammation subsequently extended up the inner side of the leg. When first seen, she was evidently much out of health, although no one organ could be said to be particularly affected. On the 28th of March, she was attacked with severe rigors, and experienced pains in different parts of her limbs: the rigors were repeated for several days in succession. The inflammation of the leg now entirely disappeared, and she complained of pain in the right knee, which was slightly swollen. On the 31st, her bowels became much relaxed; there was great general depression, and much nervous agitation. Both knees were swollen. The general symptoms now became somewhat relieved; but on the 4th April, she was attacked with vomiting, which recurred frequently during the day, and was accompanied with great depression, and severe pain in the epigastrium. On the 5th, the sickness continued, apparently quite uninfluenced by any remedies. She passed considerable quantities of blood by stool: her countenance presented a dusky yellow hue: the pulse was excited, without power, and the sense of depression was greatly increased. On the 7th, the vomiting still continued, and she still passed blood by stool. Some spots of a dark purple colour now made their appearance upon her face. The hands both became slightly swollen; and upon the right one, some small, dark, livid spots, similar to those upon the face, made their appearance. She was much troubled with hiccough. On the 9th, the countenance was very anxious, the complexion more sallow: some more livid spots appeared upon the face and cheeks. The right hand and arm were swollen and painful: some fresh livid spots appeared, upon the knuckles. Complained much of faintness: had extreme debility with occasional hiccough: pulse extremely weak: the surface of the body was covered with cold perspiration. The sickness had entirely ceased, and there was no blood in the motions: the tongue was rather dry in the centre, but tolerably clean. 10th. She wandered slightly during the night, and vomited once: some blood again appeared in the motions; the right hand and arm were less swollen. 11th. The countenance was anxious, the pulse about 90, and intermitting irregularly. The vomiting recurred several times. The livid spots on the right hand had not increased in size, but appeared like distinct small black superficial sloughs of the skin; these all scabbed off, without suppuration. 12th. The pain and swelling of the arm had nearly subsided. The bowels acted very freely with the aid of medicine, and she expressed herself much relieved. From this time the patient slowly but gradually improved, with one or two slight intermissions, till the beginning of

May, when she again complained of pain at the inner part of the right arm, above the elbow. Some hardness could here be felt in the course of the basilic vein. Some small collections of matter were now deposited upon the back of the right hand, resembling, in some respects, the eruption of confluent small-pox. On May 11th, she had regained much of her strength, but still felt some pain in the elbow upon motion. She also complained of the joints of one of her fingers. She now left London for change of air.

The following Table is formed of Cases taken consecutively during One Year.

Heads of Cases.	Period of secondary inflammation.	Post-mortem appearances.
Case iv. Elizth. Mackintosh, æt. 25. Inflamed bursa patellæ; erysipelatous inflammation in the neighbourhood of the right axilla; sudden suppression of the catamenia; rigor; peritonitis; tongue covered with yellowish white coating; sickness; "catching pains" in the epigastric region.	A few days after the appearance of the erysipelatous inflammation; three days before death.	Dark-coloured serum, mixed with shreds of recently effused lymph, in the cavity of the left pleura; large quantities of sero-purulent fluid, with recently effused lymph, in the peritoneal cavity.
Case v. James Stevens, æt. 46. Punctured wound of the finger whilst opening a rabbit; diffuse cellular inflammation of the right arm; spasmodic and "catching pains", principally referred to the epigastrium; expectoration of bloody fluid.	Twenty-seven days after the injury; about seven days before death.	Bloody fluid in the cavity of the left pleura; pus in the left elbow-joint.
Case vi. William Collins, æt. 36. Bruise of the patella, caused by the wheel of a carriage; apparent recovery; erysipelatous redness over the left knee; rigor; rapid pulse; hot skin, followed by perspirations, pains in the head, restlessness, delirium.	Twenty days after the accident; three days before his death.	Cavity of the knee-joint containing a quantity of thick grumous fluid, apparently a mixture of blood and synovia; fibrous degeneration of a portion of the cartilage of the patella; turbid serum in the sub-arachnoid cellular tissue; bloody puncta in the brain, larger and more numerous than natural; posterior part of both lungs gorged with blood.
Case vii. Maria Martin, æt. 39. Caries and necrosis of the tibia, with large ulcer of the leg.	Several months after the occurrence of caries of the tibia; a few days before death.	The skin of the upper part of the leg and the whole of the thigh of a mottled appearance, caused by extensive dark patches of incipient gangrene; the cellular tissue of the limb infiltrated with lymph and pus.
Case viii. George Mason, æt. 42. Compound comminuted fracture of the metacarpal bones; inflammation of the absorbents; erysipelatous redness of the skin; secondary abscess in the affected arm; rigidity of the muscles of the tongue; trismus; universal affection of the muscles.	Nine days after the injury; twenty-two days before death.	Increased degree of congestion, both in the grey and white substance of the brain; substance of the pons Varolii and of the medulla oblongata of a pinkish colour, and presenting irregular streaks of increased vascularity; spleen soft, and somewhat congested.

Heads of Cases.	Period of secondary inflammation.	Post-mortem appearances.
CASE IX. Sarah Leg, æt. 50. Necrosis of a portion of the tibia, accompanied by a large foul ulcer.	A few days before death.	Effusion of serum and lymph in the cellular tissue, which surrounds the pharynx and œsophagus; inflammation and ulceration of the mucous membrane of the larynx; slight inflammation of the lungs; the spleen of a greyish red colour, more solid and more easily lacerated than natural.
CASE X. Elizabeth Moleno, æt. 42. Strangulated femoral hernia of the left side; operation; erysipelatous blush around the wound upon the third day, followed by sickness, cold perspiration, and delirium; several dark patches upon the skin of the right leg.	Eight days after the operation; four days before death.	The lining membrane of the right internal saphenic vein of a dark livid colour throughout, the cavity of the vessel filled with a large quantity of coagulated blood mixed with puriform fluid; pus in the common iliac vein; effusion of serum around the veins of the leg; liver large and congested; mottled degeneration of both kidneys.
CASE XI. Jane Cox, æt. 60. Scalp wound; erysipelas of the head and face; transverse fracture of the external malleolus, followed by suppuration of the ankle-joint.	A short time before her death.	Mortification of the skin of the lower part of the leg, ankle, and foot; slight extravasation of blood into the arachnoid cavity, and into the substance of the brain; kidneys coarse in structure, and remarkably soft.
CASE XII. Bartholomew Sullivan, æt. 27. Lacerated and contused wound of the leg, followed by diffuse cellular inflammation, and inflammation of the absorbents; delirium; a separate large patch of mortification, surrounded by bright red congestion, appeared in the right groin the day before his death.	Five days after the accident; eight days before his death.	Mortification of the skin and cellular tissue of the right leg; the veins of the limb healthy; spleen of a pale colour, and very soft.
CASE XIII. George Foscutt, æt. 24. Fracture of the femur into the knee-joint; rigors; erysipelas of the limb, ill defined and very slow in its progress; coma; abscesses in the leg and thigh; mortification of the skin on the dorsum of the foot, and over the left hip.	Six days after the accident; twenty-two days before his death; pain in the chest the day before his death.	Hepatization of both lungs, with secondary abscesses in the left one; kidneys soft and coarse in texture, the left presenting a small deposit of apparently tubercular matter; spleen large, pale, and soft.
CASE XIV. William Wright, æt. 30. Fracture of the patella; erratic erysipelas; diarrhœa; abscesses in the leg, and in the knee-joint.	Erysipelas appeared a month after the fracture of the patella, and about the same time before his death.	Effusion of lymph in the pleura; secondary abscesses in different stages of formation in both lungs, and deposit of lymph in one kidney.
CASE XV. Henry Bateman, æt. 19. Fracture of the fibula; diffuse cellular inflammation of the leg; suppuration in the knee-joint; necrosis of a portion of the fibula.	Three months after the accident; three weeks before his death.	Recent effusion of lymph upon the pleura; incipient secondary abscess in both lungs; the tibia exposed, and its structure of a black colour, and soft.

Heads of Cases.	Period of secondary inflammation.	Post-mortem appearances.
CASE XVI. John Clark, æt. 45. Large scalp wound; rigor; followed by paralysis of one side; a portion of bone exposed, of a darkish green colour, and when removed of a putrid odour.	Nineteen days after the accident; three before death.	Effusion of lymph between the dura mater and the bone, and of pus and lymph between the cavity of the arachnoid; pus, mixed with blood, in the superior longitudinal sinus; deposit of lymph in the structure of the pia mater; recently effused lymph in the cavity of the left pleura; secondary abscesses of the left lung.
CASE XVII. Matthew Elmes, æt. 37. Injury of the wrist; diffuse cellular inflammation; abscesses in the cellular tissue, and in the wrist-joint; lower extremity of the radius denuded; pains in various parts of the body, especially the head and abdomen.	The tenth day after his admission into the hospital; four days before his death.	Secondary abscesses, in various stages of formation, in both lungs; suppuration between the different bones of the carpus; both kidneys large, coarse in texture, and flabby; the spleen soft, easily lacerated, and of a pale colour.
CASE XVIII. Mary Hopkins, æt. 19. Ulceration of the cartilages, followed by suppuration of the knee-joint; amputation; erratic erysipelas over various parts.	Erysipelas appeared a week after amputation; sixteen days before death.	Low inflammation of a portion of the left lung; dark-coloured patches of deposit in the spleen.
CASE XIX. John Wilkinson, æt. 56. Compound fracture of the right tibia; inflammation around the wound, with collections of matter; slight delirium; sickness.	Pain in the right side a week after his admission.	Turbid serum in the right pleural cavity; incipient secondary abscesses in both lungs; large cysts in the kidney.
CASE XX. James Bryant, æt. 20. Scalp wound, denuding the bone; puffiness of the scalp upon the eighteenth day; rigors, followed by profuse perspirations; restlessness; delirium; projection of the eyeballs.	Twenty-four days after the accident; five days before death.	Bone exposed to the extent of a shilling, of a yellow colour, and with a very dark diploë; effusion of lymph and pus between the dura mater and the bone, extending to the base of the skull, and through the sphenoidal fissures into the orbits; effusion of pus into the arachnoid cavity; incipient secondary abscesses in the lower lobe of the left lung: spleen large, and very soft, mottled; degeneration of both kidneys.
CASE XXI. James Williams, æt. 41. Fracture of the lower extremity of the left radius; diffuse cellular inflammation of the arm at the expiration of four weeks; abscesses in the limb, one of which communicated with the fracture; diarrhœa; vomiting; tongue dry and brown.	Ten weeks after the accident; one week before death.	Large cavity containing foul matter, in contact with the sacrum, which was exposed; abscesses between the bones of the left wrist and hand; spleen soft, congested, and grumous.
CASE XXII. John Munday, æt. 36. Prolapsus ani; hæmorrhoids; rigor; anxiety of countenance; great heat of skin; pulse 150.	The eighth day after the operation for hæmorrhoids; the fourth before death.	The mucous membrane of the whole of the large intestine of a very dark colour; congested patches of it thrown up into prominent folds; recently effused lymph upon the right pleura; secondary abscesses in both lungs.

Heads of Cases.	Period of secondary inflammation.	Post-mortem appearances.
Case xxiii. Esther Polley, æt. 50. Lacerated wound of the foot; separation of a small portion of the base of one of the metatarsal bones; pain in chest; rapid pulse; depression, with delirium.	The tenth day after the accident; the third before death.	A double fracture of the fifth metatarsal bone; inflammation of the right pleura; secondary abscesses in right lung.
Case xxiv. Henry Lacy, æt. 26. Scalp wound, exposing the bone; fracture of the skull; signs of nausea; pains in the head; "soreness of the stomach"; drowsiness and insensibility; paralysis of one side; muscular twitchings; portions of bone removed by the trephine, near the top of the head.	The eighteenth day after the accident; and a week before death.	Yellow matter in the diploë of the parietal bones, in the neighbourhood of the part where the trephine had been applied; effusion of lymph upon the surface of the dura mater; pus and lymph in the posterior half only of the longitudinal sinus; effusion of pus in the cavity of the arachnoid; some bloody serum in both pleural cavities; incipient secondary abscesses in the liver.
Case xxv. Thomas Meed, æt. 15. Injury of the leg; small suppurating sinus upon the outside of the limb; erysipelas; diarrhœa; coma.		Vessels on the surface of the brain congested; lateral ventricles distended with fluid; a thick layer of purulent lymph upon the arachnoid membrane at the base of the brain; some slight spots of ecchymosis on the anterior surface of both lungs.
Case xxvi. Thomas Daffey, æt. 42. Hæmorrhoids; operations; rigors; sickness; great abdominal pain; diarrhœa; hiccough. This patient had been salivated previous to the operation for the hæmorrhoids.	The tenth day after the operation; and ninth before death.	Incipient secondary abscesses in the right lung; liver studded, throughout its whole extent, by secondary abscesses; mucous membrane of the rectum of a dark greenish colour; effusion of pus and lymph into the hæmorrhoidal and inferior mesenteric veins; cavity of the left knee-joint distended with pus; spleen soft, pultaceous, and thickly-studded with dark-coloured blotches.

Case xxvii. George Burton, æt. 22, a stout navigator, was first seen September 18th, 1848. He had an enormous slough of the skin and cellular membrane, covering the lower part of the abdomen on the right side. He gave a most imperfect history of himself, and seemed frequently incapable of comprehending the questions which were put to him. The skin was hot and dry, the pulse 130. For several days, he remained in the same apathetic condition. The bowels were particularly obstinate, and the purgative medicines which were administered produced no effect whatever.

When the slough separated, the surface of the external oblique muscle was left as clean as if recently dissected. The skin was undermined for some extent, and no attempt was apparently being made to limit the progress of the disease, by the effusion of lymph. Fresh portions of cellular tissue consequently became affected, and the whole surface ultimately exposed was full six inches in diameter. *Sept.* 25th. Complained of some pain in the chest and upper part of the abdomen; has a constant short cough; perspires very freely. 26th. The pulse has

become weaker, but remains of the same frequency (130). It communicates a peculiar jerking sensation to the finger. 28th. Pulse 96, weaker; slight diarrhœa; he vomited several times during the day. 29th. Restless, with delirium. 30th. Passed another restless night, but became better in the course of the day; his appetite returned. *Aug. 5th.* His appetite again failed; complained of a sense of distension in the abdomen. 8th. An abscess was discovered at the lower and back part of the right leg; the skin over this presented various shades of yellow and brown, giving the appearance of having been extensively bruised. About two ounces of discoloured pus were evacuated, together with a considerable quantity of grumous blood. 10th. Has much improved since the last report; the wound discharges dark semi-coagulated blood. 13th. A second abscess now presented itself in the same leg, and the skin covering it presented the same discoloured appearance as in the first instance. When opened, it discharged dark-coloured semi-coagulated blood with the matter. He now rapidly improved in health, and at length perfectly recovered.

Case xxviii. Samuel Todd, æt. 58, fell from a wagon fifteen miles from town, and was brought up in an open cart, during a sharp frost. There was a compound fracture of the left leg. Two days afterwards, he suffered from cellular inflammation around the wound. On the 24th day, he had a slight rigor, and complained of slight stiffness in the right shoulder. He ate and drank well till within two days of his death, which took place on the thirty-fourth day.

Post-mortem appearances. Both lungs contained secondary abscesses, in various stages of formation. The left external iliac and common femoral veins were blocked up with firm coagula, and confined by these was a quantity of purulent-looking fluid; an adherent layer could, for some distance, be peeled off the internal surface of these vessels.

Case xxix. James Howard, æt. 33, had a small abscess in the dorsum of the right foot, which was followed by inflammation of the absorbents; abscesses subsequently formed in the right thigh and groin. Two months after the first appearance of the abscess on his foot, he was seized with rigors, vomiting, and profuse perspiration. He complained also of pain in the lower part of the left lung, and it was said that the respiratory murmur was deficient in this situation. He died on the 23rd day from the appearance of the symptoms of the secondary affection.

Post-mortem appearances. The skin and conjunctivæ were of a light yellow colour; there were incisions in the right groin. In the cavity of the right pleura, were some patches of recently effused lymph, of a yellowish colour. In the lower lobe of the right lung, were several patches of secondary deposit; these were found in different stages of their formation, and some of them were of considerable size; some of the pulmonary veins, in the neighbourhood of those which had suppurated, were found to contain a fluid resembling pus. On the left side was a small abscess, under the pleura costalis. The liver was healthy in structure, rather larger than usual. Kidneys healthy. The veins in the groin presented a healthy appearance.

Case xxx. A gentleman was operated upon for hæmorrhoidal tumours in the usual manner, and died shortly afterwards, with effusion of

bloody serum into one of the pleural cavities. The only peculiarity that could be detected in the appearance of the rectum was, that the blood was still fluid in one of the largest veins. This vein led directly to an ulcer produced by the operation; and, even at its extremity, it contained no appearance of coagulum.

B. CASES IN WHICH VITIATED FLUIDS WERE OBSERVED IN THE VEINS OF THE UTERUS AFTER CHILD-BIRTH.

CASE XXXI.[1] On the second day after a natural labour, a woman had prolonged rigors, which were followed by abdominal pain and much perspiration. On the fourth day, she was affected with syncope and bilious vomiting, accompanied by extreme prostration. On the fifth day, the abdominal pain, which had subsided, re-appeared with agitation and delirium. On the sixth, she had cold sweats, irregular pulse, rapid breathing, and vomiting. She died on the following morning.

Post-mortem appearances. There was a small quantity of limpid serum in the cavity of the peritoneum. Some of the uterine veins were found to contain a turbid fluid. The heart was half filled with brown blood. The lungs were congested, and the other organs natural.

CASE XXXII. A woman, twenty-two years of age, of a nervous temperament, miscarried at the expiration of the first month. She was almost immediately afterwards attacked by rigors and bilious vomiting, accompanied by pains in the loins and in the hypogastrium. On the following day, there was coma, with indications of extreme debility. On the third day, consciousness returned. There was difficult articulation, and moaning. The extremities became cold, the pulse imperceptible, and death occurred upon the same day.

Post-mortem appearances. The peritoneum was slightly injected, and contained a small quantity of reddish serum. The cervix uteri was covered with a layer of pus. Semi-transparent lymph was found in some of the uterine veins. The brain, and other organs, were found healthy.

CASE XXXIII. A feeble girl, 21 years of age, was confined at the expiration of the eighth month. On the fourth day, there was shivering and prolonged fainting. The following morning, she had acute abdominal pain, fever, and diarrhœa. On the seventh day, the symptoms had all subsided, but on the eighth the abdominal pain returned, accompanied by syncope. She died two days afterwards.

Post-mortem appearances. The peritoneum was slightly injected, and contained about a pint of red-coloured serum. The uterus was large, white, and firm, its veins half filled with fluid blood; its lymphatics natural; its inner surface lined with a layer of fetid brown blood, but otherwise healthy; the cervix covered with a grey, thin exudation. The lungs, heart, brain, and other organs, were quite sound.

CASE XXXIV.[2] Anne Biggs, æt. 39, confined March 18th, 1830, eighth child. On the evening of her confinement, her manner was much excited. On the 19th, she was incoherent, and complained of pain in the calf of the right leg, which was tender on pressure. The pulse being hard, she was bled to eight ounces. On the 28th, the leg was swollen and white; the pain in it much increased: towards evening the

[1] This, and the two following cases, are taken from Tonellé. The author is responsible for the accuracy of all the preceding cases.

[2] Dr. Ferguson.

calf of the limb became black, while, at the tendo-achillis, the skin was hot, tender, dry, and mottled. The bowels were much opened, the head giddy, the pulse quick and strong. She was again bled, to twenty-six ounces, and twelve leeches were applied to the temple. On the 21st, there was nausea, vomiting, and diarrhœa. On the 23rd, she complained much of the confusion in her head, the leg was tolerably easy, but the upper and inner part of the thigh was very tender. On the 24th, the diarrhœa continued, and there was increased weakness. A hard swelling, about half as large as an egg, appeared at the wrist, and one of the orifices made by venesection was black and painful. She died in the evening.

Post-mortem appearances. All the ventricles of the brain were dilated with serum, and there was a good deal of effusion into the arachnoid and pia mater. The viscera were perfectly healthy, except the heart and spleen: the latter was very large, and on pressing it, a large quantity of dirty red pulpy matter exuded. The lining membrane of the right auricle and ventricle, when washed, had a dark red hue. The femoral vein, just at the ingress of the saphæna, and the superficial vein in the back of the leg, had their coats much thickened, so as to cut like arteries. Their lining membrane was similar to that of the right cavity of the heart. When they were divided, purulent matter, mixed with thin light-coloured blood, escaped. The cellular tissue forming the sheath of the femoral vessels, and on the calf of the leg, shewed marks of recent inflammation; but there was no appearance of pus in these situations. None of the glands in the groin or ham were enlarged. The inferior vena cava appeared healthy.

C. CASES OF PURULENT DEPOSITS, CONNECTED WITH INFLAMMATION OF THE VEINS AFTER DELIVERY, RECORDED BY DR. ROBERT LEE IN THE MED.-CHIR. TRANSACTIONS.

Case xxxv. Mrs. Mayhew, æt. 33, was delivered on the 2nd March 1829. On the 5th, there was a discharge of blood from the uterus. From the 6th to the 20th, she made no complaint of uneasiness in any region of the body, though her strength rapidly declined. The countenance was of a dusky yellow hue. The heat of the surface slightly increased; the respiration hurried, particularly on bodily exertion, and the pulse above 130, and feeble; the tongue pale and glossy, with loss of appetite. The lochial discharge had a peculiarly offensive smell. She died upon the 28th of March.

Post-mortem appearances. When the uterus was laid open, there was found to be a portion of the placenta, about the size of a nutmeg, in a putrid state, adhering to its inner surface. The substance of the uterus, to the extent of an inch around this, was of a peculiarly dark colour, almost black, and as soft as a sponge. On cutting into it, about a teaspoonful of purulent matter escaped from the veins, and a small additional quantity was pressed out from them. . . On opening the capsular ligament of the right knee-joint, about six ounces of thin purulent matter escaped, and the cartilages of the femur and tibia were extensively eroded. There was no appearance of inflammation, however, on the exterior of the capsular ligament. The right wrist was swollen, and the cellular membrane around it was unusually vascular, and infiltrated with serum.

Case xxxvi. Mrs. Pope, æt 40, was delivered, on the 26th of Oct.,

of her fourteenth child, and appeared to recover favourably until the 3rd of Nov., when she was suddenly attacked with a severe rigor. This was followed by intense head-ache, vomiting, general soreness of abdomen, and suppression of lochia. Nov. 6th. Great prostration of strength; laborious respiration, with pain at the bottom of the sternum, and frequent hacking cough; pulse 135, extremely feeble; skin hot and dry. . . Occasional retching and vomiting. Several hard, lumpy cords were found running up in the inside of the thigh, in the direction of the superficial veins. 7th. Delirium; general debility greatly increased; the surface of the body was covered with a yellow suffusion; the middle finger of the left hand was much swollen around the second joint, and the skin covering it was of a dusky red colour.

Case xxxvii. Mrs. Edwards, æt. 35, was suddenly attacked, three weeks after delivery, with pain in the calf of the right leg, and loss of power in the whole right inferior extremity. On the 5th day from the attack, a considerable swelling, without induration, had taken place from the ham to the foot, and great tenderness was experienced along the inner surface of the thigh to the groin. The extremity became universally swollen, painful, and deprived of all power of motion. The temperature along the inner surface of the limb increased; the integuments were pale and glistening, not pitting upon pressure. The femoral vein, from the groin to the middle of the thigh, was indurated, enlarged, and exquisitely sensible; pulse 80; tongue much loaded; thirst; bowels open. On the 23rd day from the attack, the disease was apparently declining. The femoral vein could no longer be felt, but there was still a sense of tenderness in its course down the thigh, and she experienced considerable uneasiness between the umbilicus and pubes, as well as in the loins. She now, for the first time, began to have rigors, accompanied by a quick pulse, loaded tongue, and thirst. From this period to the 31st day, the swelling of the limb and tenderness in the course of the femoral vessels subsided, but she experienced attacks of acute pain in the umbilical region, loins, and back, which assumed a regular intermittent form. Every afternoon there was a rigor of an hour's duration, followed by increased heat, and profuse perspiration: the skin was hot and dry; pulse 125; tongue brown and parched; bowels open. These febrile attacks gradually declined in severity, and she appeared to recover till the 43rd day, when she had a long and violent fit of cold shivering. The countenance now became expressive of great anxiety, and the pulse extremely weak and feeble. 45th day. Vomiting; pain upon the left side, increased upon taking a deep respiration. 46th day. Another severe and prolonged rigor; skin hot and dry; pulse 140; tongue brown and parched; diarrhœa; respiration hurried, with frequent cough; surface of body presenting a peculiar yellow tinge. The conjunctiva of the right eye now suddenly became of a deep red colour, and so much swollen, that the eyelids could not be closed. On the day following, the left eye also became red and swollen, the surface of the body was cold and clammy, pulse 140, extremely feeble, with great debility, and repeated attacks of vomiting. From this date, the patient lived nearly three weeks, but for the last fortnight the vision in both eyes was entirely destroyed.

Post-mortem appearances. The left pleural cavity contained upwards of two pints of a thin, purulent fluid. The inferior lobe of the left lung

was of a dark colour, and soft in texture. In its centre, about an ounce of thick cream-coloured pus was found deposited in its dark and softened texture. This was not contained in any cyst or membrane, but was infiltrated into the pulmonary tissue. The coats of the vena cava inferior were considerably thickened; its whole cavity was occupied by a coagulum, terminating above in a loose pointed extremity. The left common iliac vein was plugged up, by a continuation of the coagulum from the cava. The coagulum was continued beyond the entrance of the internal iliac, which it completely closed, and terminated in a pointed extremity about the middle of the external iliac. Neither the remainder of the vessel, nor the femoral vein, exhibited any morbid changes. The right common iliac vein was contracted to more than one-half its natural size; it was firm to the touch, of a greyish blue colour; to its internal coat adhered an adventitious membrane of the same colour, containing within it a firm coagulum. The internal iliac was rendered quite impervious by dense, dark-coloured bluish membranes; and, at its entrance into the common iliac, it was converted into a solid cord. The contracted external iliac contained within it a soft yellowish coagulum; its coats were three or four times their natural thickness, and lined with dark-coloured membranous layers. The right femoral vein, from Poupart's ligament to the middle of the thigh, was diminished in size, and almost inseparable from the artery. Its tunics were thickened, and its interior coated with a dense membrane, surrounding a solid purple coagulum strongly adherent to it.

D. CASE, SHEWING THE PERIOD AT WHICH A COAGULUM MAY GIVE WAY IN A WOUNDED VESSEL.

Case xxxviii. George Haydon, ætat. 37, received a wound about half an inch in length over the right radial artery, on March 5th, 1848. The hæmorrhage was arrested by pressure. On the 12th, a small slough formed in the bottom of the wound, the edges of which were inflamed and painful. On the 14th, slight bleeding from the wound occurred, which at first was arrested by the application of cold; but in the evening it recurred in considerable quantity, and again was checked by cold and pressure; during the night, however, profuse hæmorrhage again took place, and was only stopped by the application of the tourniquet above the elbow. On the 15th, the radial artery was tied; but as this did not prevent the hæmorrhage from returning, when the tourniquet was relaxed, the original wound was enlarged. The opening in the radial artery was now with some difficulty discovered; it extended two-thirds round the circumference of the vessel, leaving one-third undivided.

E. CASES SHEWING THE ORGANISATION OF THE OUTER LAYER OF EXTRAVASATED BLOOD; REPORTED BY MR. HEWETT.

Case xxxix.[1] A middle-aged man received a severe injury of the chest; he lived eleven days after the accident, and during this time he never presented a single inflammatory symptom. The cavity of the left pleura was found completely filled with bloody fluid, and was subdivided into two compartments, by a portion of coloured fibrine, presenting a honeycombed appearance, which passed from the ribs to the lung. The lower compartment was itself subdivided into several others, by layers of

[1] Med.-Chir. Transactions, vol. xxviii.

coloured fibrine intersecting each other. Large portions of loosely coagulated blood were found in all the cavities; some of these clots were of a rusty colour, others approached nearer to the natural colour of the blood. The lung was compressed against the spine, and the whole surface of the pleural sac was coated by a false membrane, about two lines in thickness, formed by coagulated fibrine. The fibrine which lined the pleura pulmonalis and pleura diaphragmatica, presented on its inner surface a smooth and polished appearance, and in colour exactly resembled the yellowish fibrine found in the clots of the heart of this patient. So uniform was the coating, and so continuous was it throughout its whole extent, that it looked at first merely like thickened pleura; but this appearance was easily destroyed, by peeling off this adventitious membrane from the serous tissue, which there presented the same appearances as the pleura on the opposite side, with the exception of not being quite so smooth: there was neither thickening nor the slightest increase of vascularity in this pleura. A large rent, from which the hæmorrhage had proceeded was found in the substance of the lung.

Case xl. A man was attacked with diffuse cellular inflammation of the inferior extremity, which terminated in two days with extensive gangrene of the skin. In the superficial and common femoral veins were extensive coagula; these did not completely fill the veins, but slightly adhered at different points to their internal coats. These clots still retained, in some places, the colouring matter of the blood, whilst at others the colourless fibrine alone remained; in both veins, the clots were enveloped in a perfectly transparent, smooth, and polished membrane, presenting the appearance of a serous tissue. In the structure of these membranes were several distinct arborescent vessels, minutely injected;[1] some of these vessels were of sufficient size to allow of the blood being made, by gentle pressure, to circulate through them; but no communication could be traced between these vessels and the coats of the veins. The membranes were easily peeled off from the surface of the clots with which they were in contact. The interior coats of the veins presented their natural colour and polished surfaces, except at the points where the slight adhesions above-mentioned existed.

ON THE MECHANISM OF TEXTURAL NUTRITION.

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The first step in the actual process of nutrition, is the attraction of the homogeneous part of the blood by the tissues.[2] The blood being contained in the vessels, that part only which transudes through their walls into the parenchyma of the organs can contribute to nutrition. Hence, even though a large quantity of rich healthy blood be circulating through the vessels, the textures will be imperfectly nourished, unless sufficient

[1] Mr. Gray, the Curator of the Museum of St. George's Hospital, has recently shewed me the outer layer of an effusion of blood into the arachnoid cavity, injected from the middle meningeal artery.

[2] Valentin's Physiologie, Band 2, Sect. 2068. Mueller's Physiologie, p. 75.

exudation takes place; but nutrition will be restored, so soon as an adequate quantity of blood is made to pass through the walls of the vessels. An excessive exudation of serum into the parenchyma, no doubt, likewise impedes nutrition, by producing pressure on the textures, and thus impeding their attractive power. That this is probably the case, may be inferred from the following considerations: 1. The evolution and nutrition of organs is impeded by pressure from without; and the same effect is no doubt produced by pressure from within. 2. The textures become atrophied, whenever they are pressed on by an adjoining part which has had its bulk enlarged by inflammation or other causes. 3. Inorganic processes are retarded by pressure; thus, crystallization can only take place when sufficient space is afforded. The organic processes, then, consisting in a selection and attraction of sinular parts, have the greater need of sufficient space.

The process of nutrition may then be supposed to be modified by all those forces, which cause an alteration in the quantity or quality of the blood effused into the parenchyma; or rather, by those influences which affect the transudation of the nutritive part of the blood through the coats of the vessels. The forces which modify the exudation of blood through the coats of the vessels are the following:—

1. *The Quantity of Blood Circulating in the Vessels.* The larger this quantity is, the more the vessels and their pores are distended, and more blood passes into the parenchyma, and *vice versâ*. If a fluid be driven through an elastic tube, the latter will be distended in proportion to the force applied.

2. *The Quantity of the Blood-Corpuscles.* Many blood-vessels *(vasa serosa)* are of smaller diameter than the blood-corpuscles; and hence must be distended when they pass through them. It is incorrect, and quite in contradiction to physical laws, to assert, with some physiologists, that the corpuscles are compressed and become elongated, in passing through these vessels. Being propelled by a *vis à tergo*, they must become broader, but never more slender. On pressing an elastic globe through an elastic tube, the former will not become thinner, but both will be distended. Hence, the more corpuscles there are in the blood, the more the vessels and their pores are distended.[1]

3. *The Energy of the Forces which Propel the Blood into the Small Vessels.* The capillaries and their pores are distended in direct proportion to the energy with which the blood is sent into them by the heart and large vessels. This may be demonstrated by forcing, with varied pressing power, a quantity of fluid through an elastic tube.

4. *The Temperature.* Within certain limits, a high temperature favours distension of the vessels, while a low one causes them to contract.[2]

We find, in the above principles, the explanation of many of the phenomena of health and disease.

I. The similarity between the symptoms of anæmia and those of hyperæmia, is evidently accounted for. In both diseases, nutrition is interrupted; in anæmia, by want of blood; in hyperæmia, by its super-

[1] Haas (Dr.) Ueber die Function der Blutkörperchen. Œsterreichischer Jahrbücher, Jan. 1848.

[2] Valentin's Physiologie. Band i, sect. 1086.

fluity, which produces pressure on the tissues, and impedes their power of selection and assimilation. In hyperæmia, the vessels are over-distended, and too much blood passes through their coats into the parenchyma.

II. We find an explanation of the general organic weakness, which is constantly observed in fevers. The heart being, in these diseases, too energetic in action, the vessels are over-distended, and an excessive quantity of blood is effused, producing effects similar to those which occur in hyperæmia.

III. The secretions, as the urine, sweat, and saliva, are impeded in fevers by this pressure of the blood on the textures. In spite of the presence of a large quantity of blood in their parenchyma, the organs are in want of material to furnish the secretions; for they require a large proportion of water, which is not afforded by the blood which passes through the pores of the vessels in a fibrinous state. Bruck's experiments shew, that a large proportion of water and soluble salts, and very little albumen, pass through small pores; but that through large pores, such as there are in fevers, there pass very little water and saline matters, and much albumen. The parenchyma of the secreting organs, then, contains very little water in fevers. This impediment to the secreting functions, causes the retention in the blood of a large quantity of urea, saline matter, etc.; but after the fever had subsided, when the action of the heart has diminished, and the vessels are less distended, the quantity of blood is not only diminished, but becomes more watery: the secreting organs are stimulated to action by the matters which have been retained, and the blood is also more able to remove them. The urea and salts increase in the urine, producing a sediment, the appearance of which denotes a *crisis*.

IV. A diminution in the quantity of blood is the cause of the summer sleep of the amphibia. Berthold and Davy found the temperature of these animals always lower than that of the atmosphere: this is produced by the evaporation of water from their bodies increasing with the temperature. Hence, in a high temperature, the quantity of blood in these animals is much diminished by their losing a large quantity of water; and, in circulating through the vessels, it does not distend them sufficiently to allow the nutritive part to exude. Nutrition, then, being partially suspended, the animals fall into a lethargic state. This explanation is an accordance with the fact, that the amphibia creep into a hiding place in dry, and awake in wet weather. They are not awaked by being carried into a cold room, but by being immersed in water.

V. A similar explanation will account for the fact, that animals are unable to live longer than twenty days on dry food, without any fluid, while they can exist for fifty days when supplied with water alone, but in sufficient quantity. As long as the animals get no fluid, the blood loses water daily in the urine, saliva, sweat, and breath. This loss can never be repaired by dry food, for the stomach cannot digest a sufficient quantity. The blood, thus reduced in quantity, passes through the vessels without being able to distend them, and afford nutritive material, as in the summer-sleep of amphibia. The want of water also causes a thickening of the blood, which co-operates with its want of power to distend the vessels. But if the animals are supplied with a sufficient

quantity of water, without any food, they survive for a longer time. Although water contains no nutritive material, and cannot be transformed into nervous or muscular tissue, it nevertheless indirectly contributes to nutrition, by increasing the quantity of the blood. The vessels are sufficiently distended, and the blood passes into the parenchyma, and supports life longer, in spite of its possessing very low nutritive power.

VI. The winter-sleep of animals has its origin, like the summer-sleep, in an interruption to nutrition. The summer-sleep is caused by the loss of water; the winter-sleep by the diminished activity of the heart's action, consequent on the influence of cold. It has been found that in hybernating animals, at the commencement of the winter-sleep, the pulsations of the heart subsided from 200 to 50 in a minute. The heart being thus weakened, is not able to propel the blood with sufficient force to distend the vessels, which are much more contracted in cold weather. In such circumstances, no blood passes through the pores into the parenchyma, nutrition is interrupted, and the animals fall into a state of asphyxia, losing the power of feeling and perceiving. The reason why some animals only are subject to hybernation, is to be found in their various degrees of sensibility. Those whose heart is unable to resist the weakening influence of cold, are seized on by winter-sleep. This explanation is confirmed by the fact, that we observe young animals asphyxiated by a degree of cold, which they would bear with impunity if full-grown. Legallois observed this in rabbits, six or eight weeks old.

The cold-blooded animals are also very soon overpowered by cold; but this is dependent on two causes. Not only are they more susceptible of the influence of cold, but their small quantity of blood acts at a disadvantage. The quantity of blood would be sufficient, if the heart acted with sufficient energy: but the heart's action failing, the blood merely circulates in the vessels, without being able to pass through their coats.

VII. The diminished activity of the heart, and the contraction of the vessels, in cold weather, explains why we are compelled to take a larger quantity of food in winter, or when living in a cold climate. We endeavour to supply the want of one force which contributes to nutrition, by increasing others—to make up for the insufficient action of the heart by increasing the quantity of blood. If a fluid be pressed through an elastic tube, its walls will be less distended as the force is diminished, but more distended if the quantity of fluid be increased. If the quantity of fluid be increased in the same proportion as the propelling force is decreased, the distension of the vessels remains the same. The degree in which cold impedes nutrition, may be observed in the inhabitants of the frigid zones. They are stinted in growth; their bodies are short, their muscles thin, their senses obtuse, their mental faculties very weak, and the sexual instinct, the catamenial flow, and the fecundity, are much less than in other people. The same quantity of blood, which is sufficient for nutrition in a warm climate, is not so in a cold one. In the latter also, the heart is less active, and the vessels more contracted. For effecting adequate nutrition, a certain quantity of blood must pass into the parenchyma; and if the heart cannot act with sufficient energy to propel sufficient blood to dis-

tend the vessels, the absolute quantity of blood must be increased: otherwise a general stinting of growth results.

As the blood is the carrier of animal heat, we encourage, by increasing its quantity, and especially its penetration through the walls of the vessels, not only the nutrition of the tissues, but also the sensation of external warmth. We possess more blood in winter than in summer, and are hence more disposed to inflammation in the former season. We more easily, and for the same reason, bear a high temperature in the winter than in the summer. Warmth excites the heart's action, and promotes distension of the vessels: and if these at the same time contain much blood, congestions and inflammations are liable to occur.

The opinion of Liebig, that we are obliged to eat more in winter than in summer, because we inspire more oxygen, is not adequate to explain the facts above referred to: 1. According to Liebig, we possess in summer more blood than in winter, in which latter season the oxygen consumes more of the blood. If it were so, the tendency to inflammation ought to be greater in summer than in winter. 2. It ought not to be easier to bear a high temperature in summer than in winter. 3. Liebig's view does not explain why the amphibia and young animals become more easily asphyxiated in cold weather. The oxygen cannot have consumed a sufficient quantity in such a short time. 4. If an organ be subjected to the influence of cold, it loses sensation, as if deprived of blood.

VIII. The same instinct which compels us to take more food in winter, also invites us in the same season to make use of spirits. These, by exciting the heart to more frequent and energetic contraction, directly oppose the influence of cold, which weakens the heart, and prevents it from contracting with energy. By increasing the activity of the heart's action, spirits cause the greater distension of the vessels, and thus contribute to the nutrition of the organs. But, though to a certain extent equivalents to food, they never contribute directly to textural nutrition.

The protection which spirits afford against cold, is produced by the diffusion of animal heat by means of the effusion of blood into the parenchyma. Liebig explains this phenomenon, by the evolution of warmth from the combustion of spirits by the oxygen: but this opinion is liable to the following objections: 1. If the increase of animal heat by the use of spirits were dependent on this chemical action, the same quantity of spirits should produce the same amount of heat in all persons. But experience shows that this is not the case. Individuals, who are not accustomed to spirits, feel very warm, and even perspire, on taking a small quantity, while those who are addicted to their use, feel no effect from the same quantity. This agrees entirely with the statement above given,—that the effect produced by spirits is the consequence of their stimulating action on the heart: 2. Spirits are never burnt at such a temperature as is generally found in animals: 3. They are expired generally by the lungs, and not therefore burnt: 4. Fat is likewise burnt as by the oxygen; and yet we do not feel warmer after making use of it.

In the preceding theory, we find the explanation of the fact that

drunkards live on a small quantity of food. A small quantity of blood affords as much nutrition to them, as a larger quantity to other persons; for, in consequence of their taking spirits, the heart propels this small quantity of blood into the small vessels with such energy, that they are as much distended by it, as by more blood, with the normal activity of the heart. After having abstained from spirits for some hours, the drunkard feels very weak, and is not better till he has again taken liquor. He does not feel strengthened by taking food, as other individuals do. The reason of this is his general anæmia. By the use of spirits, the heart is caused to propel the blood forcibly, so as to distend the vessels, and the tissues are nourished. But the stimulus being removed, the activity of the heart subsides to its normal standard; the blood in the parenchyma is partly consumed by the tissues, partly absorbed by the lymphatic vessels. As the normal activity of the heart is insufficient to propel the small quantity of blood, the tissues are soon in want of food: hence the individual feels weak. But the simple use of food cannot strengthen him, because the quantity of blood cannot be restored with sufficient rapidity, as has been explained in my observations on the starving of animals by the use of dry food. The drinking of water or other fluids is more effectual than taking food. The quantity of blood is increased; and the vessels and their pores being distended, nutritive material is more exuded into the parenchyma. In this way we may explain the cure of delirium tremens by drinking a large quantity of water. The want of appetite in drunkards is a natural consequence of the chronic inflammation of the stomach.

IX. In the same manner as spirits, warmth supports animal life. Animals partially starved, and already insensible, can be roused by artificial warmth. After ten minutes, the animal rises up, takes food, passes fæces and urine; and is, during the application of warmth, lively and merry. Warmth excites the heart, and distends the vessels: so that the blood, in spite of being reduced by fasting to a very small quantity, passes through the walls of the vessels more readily than before heat was applied. In this way the tissues obtain nutritive material; and the organs again recover their activity.

X. But animals die sooner after being subjected to artificial warmth, than when left insensible. This is to be explained by the same remarks as I have made in speaking of summer-sleep, and of the starving of animals when restricted to the use of dry food. In all these circumstances, the animals die from the want of blood in the parenchyma, produced by the loss of water. For, when awaked, they part with a large quantity of water in the urine, sweat, and breath; all which secretions are, like the nutritive material, furnished by the blood. The blood is thus much more diminished, than if the animals had been left in their state of asphyxia. Chossat asserted, that pigeons, which were undergoing starvation, lost twice as much weight when roused by artificial warmth, as when left quiet.[1] This is more the effect of secretion, than of the process of nutrition.

XI. In the principles which I have laid down, we find an explanation of the changes which the blood undergoes under various circum-

[1] CHOSSAT. Récherches sur l'Inanition, p. 121.

stances. There can be no doubt, that any impediment to the process of nutrition must produce an alteration in the blood in the vessels; for those materials, which ought to be applied to nutrition, and transformed into different textures, remain in the blood. It being established, that the quantity of blood in the vessels, the number of blood corpuscles, the energy with which the propulsive agents in the circulation act, and the amount of temperature, produce modifications of the nutritive process, it is equally probable that they tend to alter the blood in the vessels.

In order to show what parts of the blood increase with the augmentation, and decrease with the diminution of nutrition, we must show what materials are subservient to this process. These are, besides some salts, fibrin and albumen. The corpuscles, being unable to pass through the walls of the vessels, cannot be considered as affected by the increase or diminution of nutrition.

The albumen and fibrin, though both subservient to nutrition, are destined for distinct purposes. The fibrin nourishes the tissues; but the albumen is transformed into fibrin and corpuscles. That the blood-corpuscles are formed from albumen, is proved by considering that they must be formed *in* the vessels, as they cannot pass through their pores; and as they are similar in composition to albumen, they are without doubt formed of it. That the fibrin is formed from albumen, can be demonstrated by the following facts: 1. The chyle contains more albumen and less fibrin, than the blood; consequently, a part of the albumen must have been transformed into fibrin. 2. The chyle, immediately after being absorbed by the lacteal vessels from the intestines, contains more albumen, and less fibrin, than that which has passed through the mesenteric glands. 3. Lymph contains much more fibrin, and less albumen, than blood-serum. But as the lymph is formed in the parenchyma of the organs from the blood-serum, which contains but little fibrin, the fibrin in it must be formed from albumen. 4. The arterial blood contains more fibrin, and less albumen than the blood in the veins; and this can only result from the transformation of the latter material into the former.

The albumen is therefore not only consumed for the purposes of nutrition, but is in a great measure transformed into fibrin and blood corpuscles. Hence any increase or decrease in the quantity of albumen is not only dependent upon the various degrees of activity of the nutritive process, but also on the extent to which it is transformed into fibrin and blood-corpuscles. If this action be impeded, the albumen must, if it be restored by food, increase in quantity, in spite of the apparent performance of textural nutrition.

Fibrin differs from albumen, in its mode of reparation. Albumen is only restored by food; and if none be taken, the albumen is not renewed. But fibrin, being formed from albumen, is restored even if no food be taken. It is nevertheless to be remembered, that the chyle also contributes a share to the formation of fibrin.

We are now able to point out some laws, which regulate the increase or diminution of the albumen and fibrin.

The albumen increases: 1. When food is taken as before, if either the nutrition of the textures, or the formation of blood-corpuscles or of

fibrin be impeded. In consequence of this, the albumen increases: (*a*) In chlorosis, where the formation of blood-corpuscles is impeded by the want of iron, or from some other cause. But if less food be taken than before, the albumen cannot be increased. (*b*) In many toxæmic diseases, as typhus, intermittent fever, bilious fever, &c., the poisons of these diseases in general impede the formation of fibrin:[1] and if the attack takes place on the same day on which food has been taken, the albumen will be restored by the chyle, and must increase. But if an animal be seized after fasting for some days, or if the blood be drawn three or four days after the toxæmic influence have first acted, we shall not find an increase of the albumen. The influence of food accounts for the albumen being sometimes in excess in chlorosis, and in toxæmic diseases, and sometimes in defect. 2. If, while the nutrition of the textures, and the formation of corpuscles and fibrin, are performed as before, more food is taken. In consequence of this, the albumen is increased in plethora.

The fibrin increases: 1. If, while it is being formed as before, nutrition is impeded. In consequence of this, it increases: (*a*) In all inflammatory fevers, where nutrition is impeded by the violence of the circulation, but where no cause operates to retard the formation of fibrin, which is still formed from albumen, even though very little food be taken. (*b*) After bleeding, when nutrition is impeded by the blood not being in sufficient quantity to distend the vessels. This increase is only relative, in proportion to the other parts of the blood; the loss of all parts has been equal, but the fibrin is soonest restored. The blood-corpuscles require time for renewal, and the albumen can only be supplied by food. (*c*) In abstinence, where the albumen is not restored by food, but the fibrin continues to be formed from albumen, the same phenomenon takes place as after bleeding. (*d*) In all diseases in which the blood-corpuscles are diminished, the vessels are not distended sufficiently to allow the fibrin to pass into the parenchyma of the various organs. This is the case in chlorosis, scirrhus, morbus Brightii, the latter months of pregnancy, and tuberculosis. Under all these circumstances, an access of fever determines an increase in the quantity of fibrin. 2. If, when the formation of fibrin continues to be performed as before, a large quantity of fibrinous food be taken. This is the result of an animal diet; for in this case, the chyle contains much more fibrin than when a mixed diet is used.

The albumen decreases, whenever its expenditure is greater than its supply by the food. This takes place in fasting; where, though but little albumen passes through the coats of the vessels, it is consumed in the formation of fibrin and corpuscles.

The fibrin decreases only if its formation be impeded. This takes place in various narcotisations and poison-diseases, as poisoning by opium, hydrocyanic acid, typhus, miasma, etc.

It is here the place to refer to the causes of the increase or decrease of the blood-corpuscles in different diseases. We have first to point out how they are *spoiled*, in the healthy state. On this point, we have

[1] It does not follow that every poison impedes the formation of fibrin; for all poisons are not alike.

only hypothetical ideas: but as it is established, that the small vessels are distended by the passage of the corpuscles, an amount of friction must be exercised, which must tend to render the corpuscles unfit for use. It follows, that the oftener the corpuscles circulate through the vessels, the more they are spoiled: but this rule is not without exceptions. It may happen, that the corpuscles are often propelled through the vessels without being injured; this occurs if the walls of the vessels are soft, and capable of yielding. In this case, the corpuscles must increase, if their formation be not impeded. They must decrease, if their formation be impeded, or the vessels be resistant, and the heart act more frequently. Hence they decrease in fevers, because the contractions of the heart are more frequent. They increase in typhus and other toxæmic diseases, where the vessels are yielding, which is denoted by the softness of the pulse; for as the vessels do not resist the pressure of the finger from without, they cannot be supposed to oppose the pressure from within. This is the result of the action of the poison. If, however, the formation of the corpuscles be impeded, they decrease, notwithstanding the softness of the vessels. This sometimes happens in chlorosis.

(To be continued.)

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The London University Calendar. 1850.

Regulations of the Royal College of Surgeons in London. 1828, 1835, 1838, 1839.

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In our last number, we took a dispassionate review of the condition of the Medical Profession in the present day, as contrasted with the position which it occupied in the seventeenth century. Our object was most especially to show, that the science of medicine, which was formerly understood and practised only by a few, was now extensively diffused over the empire; and that this result was in great measure attributable to the improved education of the General Practitioners, who, while they form a very important and necessary branch of the profession in the large cities, are the only medical attendants of the inhabitants of the provincial towns and villages. We also showed, that while a subdivision of labour in the medical profession was appreciated and rewarded by the rich and powerful, the middling classes and the poor were yet necessarily dependent, for relief from the complicated ailments which afflict human nature, upon the skill, the humanity, and the honour of those members of the profession who combine in their education such an amount of knowledge, as renders them efficient advisers in all the branches of the healing art. We therefore came to the conclusion, that while it was just that the highest honours and emoluments should be conferred upon those specially eminent in medicine, surgery, or midwifery, it was yet far more essential, that the legislature should provide for the efficient education and examination of the great mass of the profession—the general practitioners—to whom the lives and the health of at least nine-tenths of the community are entrusted.

We propose, on the present occasion, to consider the system or systems of education which have been devised, and are now in operation, for the qualification of the general practitioner. We purposely omit, for the present, the education of the pure physician, and of the pure surgeon; and for the following reasons. The success of practice in either of these special departments, must depend upon the talents and ability of the practitioner, who can rise in the social scale only by the favour and countenance of his professional brethren, who are generally competent to form a pretty just estimate of his claims to their confidence; and who do not, as a rule, raise inferior men to distinction. Hence, a man who professes to practise what are called the higher branches of the profession, will of necessity soon find his level, and will rise or fall according to his genius or his energy. However much, therefore, we applaud the efforts made to improve the education of the pure physician, or pure surgeon, and to render their superiority real instead of artificial, we nevertheless think it far less imperative to insist upon this, though a much needed reform. The general practitioner exercises his vocation very often among, and is dependent upon, the ignorant and the illiterate, who, being unable to form any estimate of intellectual powers and educational status, cannot form sound opinions as to the acquirements of those whom they are by necessity obliged to consult. The wealthy denizen of the great city can deliberate whether he shall trust his own life, or the life of those who are dear to him, to Sir John This, or Dr. That; but the pauper, the prisoner, the lunatic, the soldier, the sailor, the artizan, and the small tradesman, have

no such power of selection, and they are completely at the mercy of those who undertake to provide for them efficient medical relief. Hence we maintain, that the education and testing of the general practitioners of medicine, ought to be an object of paramount solicitude with the Parliamentary representatives of a generous and enlightened nation.

The University of London is the first body which claims our consideration, in connexion with Medical Education. Its curriculum is comprehensive and carefully arranged; and the examinations are so distributed over a number of years, as to lead the mind of the student from step to step in science, until the time of obtaining his diploma. This plan of subdividing the examinations, while it fixes the mind to study for a lengthened period, obviates that miserable and inefficient plan by which many are enabled, on the eve of an examination, to force so much knowledge into their heads as is just sufficient to gain their certificate or license, but is far from being adequate to make them safe and useful practitioners in after life. One most admirable feature in the curriculum, is the establishment of the Matriculation Examination, which must be passed by every pupil *at the commencement of his studies*, whether he intend to graduate in Arts, Law, or Medicine. On a former occasion, we ridiculed the plan adopted by the Royal College of Surgeons of England, in demanding a knowledge of Latin, Greek, French, German, mathematics, and much more, *at the termination of the pupil's career;* but we now express our unqualified approbation of the practice pursued at the University of London, of demanding such knowledge *at the beginning*. We beg also to offer our most emphatic and decided opinion, that no person whatever should be allowed to *commence* the study of medicine, unless he have received a good preliminary education, *and have proved his proficiency before some competent authority*. The study of the classical and of the modern languages refines the taste and enlarges the boundaries of thought; the pursuit of the mathematics, or of logic, strengthens the reasoning powers and restrains the vagaries of fancy: the cultivation of chemistry and natural history makes us acquainted with the structure and peculiarities of the objects composing the material world, and gives us an insight into the boundless magnificence of nature: in fine, a liberal education elevates the moral character, and prevents its possessor from being guilty of those many meannesses, peculiar to narrow and ignorant minds.

The Matriculation Examination of the University of London lasts nearly a week, and includes questions in classics, mathematics, and natural philosophy. On the first day the student is examined in mathematics (comprehending common arithmetic and algebra), and in English history. On the second day, the subjects are Greek classics, and history, and chemistry. On the third day, the student is required to demonstrate some of the propositions contained in the first book of Euclid, and to answer questions in natural philosophy; and the last day of the written examination is devoted to Roman classics and history, and the structure and origin of the English language.

In the case of medical students, two years must elapse after their matriculation, before they can present themselves for their first medical examination. Before the time appointed for the examination, they must bring evidence of having attended certain lectures, and of having dissected for nine months; *of having attended a course of Practical Chemistry, and having attended to Practical Pharmacy during a sufficient length of time to enable them to acquire a practical knowledge of the preparation of medicines.*

The candidates are examined in Anatomy, Physiology, Chemistry, Botany, Materia Medica and Pharmacy; and the examination lasts more than a week.

The second examination for the medical diploma cannot be passed until upwards of two years have elapsed since passing the first, and the student must bring proof of having attended certain other courses of lectures; of having, subsequently to his first examination, dissected for six months; of having conducted at least six labours; of having attended to hospital practice, and clinical lectures on medicine and surgery; of having, subsequently

to the completion of his attendance on surgical and hospital practice, attended to practical medicine in an infirmary or dispensary for six months ; and of possessing a good moral character. The examination is upon Physiology and Comparative Anatomy, General Pathology, Therapeutics, Hygiene, Surgery, Medicine, Midwifery, and Forensic Medicine. When the student has passed this examination, he becomes a Bachelor of Medicine.

The last examination is for the diploma of Doctor of Medicine : and on this occasion, the candidates are examined in Logic and Moral Philosophy, and in Medicine. They are also required to write a commentary on a case in Medicine, Surgery, or Midwifery.

To the whole of this extensive course of study, candidates for the degree[1] of Doctor of Medicine of the University of London are now obliged to submit. While we consider the plan of education here proposed as one of the very best schemes of medical examination hitherto devised, we are by no means so Utopian in our views as to advocate the propriety or possibility of rendering such a system compulsory upon all medical students ; for the intellectual calibre, and the pecuniary means of the majority would, we know, be unequal to the task. The University, indeed, appears to be extremely liberal in allowing the student to pick up his knowledge where and how he can ; but the long duration, the variety, and the stringency of the examinations, and the notorious rejection of many candidates of very fair, if not of striking abilities, naturally deter a great multitude of students from entering upon a career, which will certainly involve them in a great expense of time and money, and may perhaps at last terminate in disappointment. The candidates for the London University degrees and honours are generally the most advanced, and the most ambitious students.

From a careful examination of the proceedings of the University from year to year, and a diligent perusal of the questions, both general and professional, proposed to the candidates, it is, we think, evident that the governing body do not wish to open the doors of the University to the mass of the profession, but rather to propose a species of intellectual struggle to the most accomplished students. We may also remark, that the obstacles thrown in the way of obtaining a degree by those who are in practice, may almost be styled vexatious ; thus the examinations are held only once a year, although the examiners are very handsomely paid for their attendance, and might, with very little inconvenience, hold them more frequently ; in the case of candidates, therefore, who are unable to attend upon any one of the numerous specified days or hours, their examination is deferred for a whole year, and no plea, even of illness, however well authenticated, is of any avail ; added to which, no distinction whatever is drawn, in the questions proposed, between the student just fresh from the schools (of which, too, many of the Examiners are teachers), and the practitioner of many years' standing in the profession, who may perhaps undergo the mortification of being snubbed for not being able to give the generic distinctions of a carex, or the minute anatomy of the muscles of the back. But we have perhaps no right to blame the authorities of the University for upholding the character of their diploma, and upon principles of strict justice their proceedings may perhaps be defended. With our best wishes for the continued and increased prosperity of this great national institution, we proceed to other matters.

A comparison has been instituted between the curriculum of the University of London and that of the Apothecaries' Society ; but the comparison is obviously unfair and uncalled for. The University grants its degrees to the most highly educated ; the Society of Apothecaries gives its license to those who possess a competent amount of knowledge ; the first educates *the few*, the second educates *the masses*. Many of those who pass the examination at

[1] Those who commenced their medical studies previous to 1839, are exempted from the Matriculation Examination, and can pass the Medical Examination within a shorter period.

Apothecaries' Hall, would probably be rejected at the University ; and in truth, many may fairly be pronounced competent to practise medicine with safety to the community who may be incompetent to grapple with those higher branches of science, an acquaintance with which is demanded by the University.

We have so lately considered the circumstances under which the Court of Examiners of the London Society of Apothecaries became empowered to direct the education and conduct the examination of the general practitioners of England and Wales, that it is unnecessary again to advert to that subject. We now intend to show the manner in which they have carried out the provisions of the Act of Parliament of 1815 ; and we believe that it is impossible to deny that their efforts have been attended with signal success, although every species of discouragement has been opposed to them in the performance of their duties.

The following is the state of the medical profession before 1815, as depicted by Dr. George Mann Burrows, in his Evidence before the Parliamentary Committee in 1834 : " Persons were allowed to practise as surgeons, apothecaries, and midwives, to dispense medicines, and to compound prescriptions in England and Wales, who had never received any education to fit them to exercise those functions ; *whereby the public were much injured, and the character of the medical profession was lowered.*" The same gentleman is asked, nearly twenty years after the passing of the Act : " What do you say of the manner in which they" (the Court of Examiners of the Society of Apothecaries) " have exercised their powers ?" and he replies, " I think they have carried the Act into effect, in the most material matters, in a manner which has been most highly conducive to the benefit of the members of the profession, and to the benefit of the public." [*Report on Medical Education*, Part iii. p. 17.]

We have now lying before us the Regulations of the Court of Examiners of the Apothecaries' Society, from the year 1815 to the present time ; and we cannot but remark the diligence which they seem to have evinced, during successive years, in extending the education, and thereby improving the character and rank of the medical practitioner. The Court seem to have been impressed, from the beginning, with the absolute necessity of certain branches of science to the completion of the education of the general practitioner ; and we accordingly find, that they consistently insist from first to last upon the necessity, 1st, of preliminary knowledge ; 2nd, of Anatomy and Physiology ; 3rd, of the Theory and Practice of Medicine ; 4th, of Chemistry ; and 5th, of Materia Medica.

In the first regulations issued by the Court of Examiners, dated July 31, 1815, we find that the candidate " is expected to possess *a competent knowledge of the Latin language*, and to have attended lectures on Anatomy and Physiology, on the Theory and Practice of Medicine, on Chemistry, and on Materia Medica, and to have attended medical practice in an hospital, infirmary, or dispensary." The examination, we find, consisted in translating the Pharmacopœia Londinensis and Physicians' prescriptions, in the Theory and Practice of Medicine, in Pharmaceutical Chemistry, and in the Materia Medica.

In the year 1826, the Court of Examiners published the following note in capital letters ; and to this note we beg to direct the particular attention of our readers :

" The Court are extremely anxious to impress upon those persons, who may be intending to present themselves for examination before them, a conviction of the absolute necessity of such knowledge of the Latin language, as may enable them to translate the Pharmacopœia Londinensis and prescriptions of Physicians, which they consider as a qualification indispensable to the apothecary, and which the fifth section of the Act expressly requires.

" They are particularly induced to give greater publicity to this regula-

tion, because they have had the distressing duty imposed upon them, of withholding certificates of qualification from several persons, principally from their great deficiency *in this most important pre-requisite to a Medical Education.*"

In this year, the candidate is examined in Anatomy and Physiology, and in Medical Botany, in addition to the subjects prescribed for examination in 1815.

In 1827, in addition to the other subjects of study, the candidates are "earnestly recommended to attend one or more courses of lectures on Midwifery and the Diseases of Women and Children, on the latter of which subjects they will be examined." The Court determines also that the candidate shall translate *grammatically* parts of the Pharmacopœia Londinensis and physicians' prescriptions, and "should any doubt arise as to the candidate's possessing a competent knowledge of Latin, he will be required to translate a passage or passages from some one of the easier Latin authors": and in this year, the Court repeat their admonition to the candidates of the risk of rejection if they fail in this particular.

In 1828, the student is required to attend two courses of anatomical demonstrations, in addition to the lectures on Anatomy and Physiology.

In the year 1830, the most important advances are made, and the regulations of the Court are accompanied by a preface, which is characterized by moderation and good sense. The following extracts are perfectly applicable to the circumstances of the present times.

"The Court of Examiners, in instituting the following regulations, do not by any means conceive that they are requiring the maximum of knowledge that might be expected from the apothecary, but merely that quantity of information which the general advancement of science demands, and certainly not more than is requisite to afford a just degree of security to those whose lives are entrusted to his care, including the majority of the inhabitants of every large city in the kingdom, and the bulk of the population throughout the country.

"In addition to the studies mentioned in the following pages, the Court beg seriously to impress upon parents and guardians who destine the youth under their care to the study of medicine, *that a familiar acquaintance with the Latin language is indispensable; and that a knowledge of Greek is scarcely less so*, since most of the terms of art employed in medicine and the collateral sciences, are derived from that expressive language. Natural history may be said to be essential to the proper study of the Materia Medica; and an acquaintance with the exact sciences will not only enable the student to understand more readily the admirable structure and functions of many parts of the human frame, but also assist him materially in acquiring habits of precise and correct reasoning.

"It is of great importance, that the parent who apprentices his son to an apothecary, as well as the master who receives him, should previously ascertain *that the youth has been liberally educated*, and that his classical attainments, more especially, are such as enable him to pursue his subsequent studies with credit and advantage.

"The Court have too much reason to know and lament, that notwithstanding all their precautions, the attendance upon lectures, and more especially upon hospital practice, is often grossly eluded or neglected: and they deem it their duty to express a hope that the teachers of the various branches of medical science, with whom the correction of this abuse must principally rest, will turn their attention to the removal of an evil of such magnitude. It would be competent to the teachers to insist upon periodical signatures from their respective classes, proving that the pupils are actually in attendance; and it would be equally in their power entirely to withhold certificates from those who have neglected their attendance, or to qualify the testimonial in such a manner, that the Court may apply to those who

have been negligent that degree of rigid scrutiny which the justice of the case might appear to demand."

In this year, the candidate is required to devote at least *two years* to attendance on lectures and hospital practice; the attendance on lectures upon Chemistry is doubled in amount; the same is the case with the lectures on Materia Medica; and a specific course of lectures on Botany is added to the curriculum; and we now find that the course of study includes Midwifery, and the Diseases of Women and Children, and Forensic Medicine. The examination is now found to consist in translating parts of *Celsus de Medicinâ*, or *Gregory's Conspectus Medicinæ Theoreticæ*, in addition to the *Pharmacopœia Londinensis*, and physicians' prescriptions; in Chemistry, in Materia Medica, and Therapeutics; *in Botany*, in Anatomy and Physiology, and in the Practice of Medicine.

In the year 1832 the Court of Examiners again revise their curriculum, and again append a preface characterized by the same good sense and moderation as we have had occasion to notice in the previous address. The following extract is an excellent specimen: "It can need no argument to prove that the apothecary should have a sound and liberal education, and be practically acquainted with the duties of his profession, when it is considered that he ministers to the great mass of the people in the function of the physician, and, by the usage of society, has the immediate superintendence of the public health entrusted to him. In the metropolis, and in the large provincial towns, he can be aided, in cases of difficulty, by the learning of the physician. Elsewhere, he cannot avail himself of such valuable assistance; but in cases of danger, which are of frequent occurrence, he is obliged to rely exclusively upon his own resources, and can therefore alone be sustained, under this awful responsibility, by a well-founded reliance on a knowledge of his profession."

In the address of this year, the Court again urge upon the student the indispensable necessity of a sound classical education, of a knowledge of the mathematical sciences, and of the French and German languages. They also point out the necessity of making the period of apprenticeship the season of study, *and strongly condemn the impropriety of wasting it in practical pharmacy.* They also urge upon the teachers of medicine and the collateral sciences, the advantages of *practical knowledge* to the pupils; and they especially direct the attention of both teacher and student to the important subjects of practice, chemistry, and clinical medicine. The curriculum of this year presents no important variation from that of 1830; but we now find that the courses of Anatomy and Physiology, and of Anatomical Demonstrations, are directed to be of the same extent as is required by the Royal College of Surgeons of London, evincing an evident desire, on the part of the Society of Apothecaries, to act in harmony with the College. The examination in this year, includes, for the first time, the important subject of the Diseases of Pregnant and Puerperal Women, and the Diseases of Children.

In the year 1835, the Court again make most important alterations in their curriculum, and their mode of examination. The principle is distinctly enunciated, that the term of apprenticeship may and ought to include *the whole period of medical study;* and the attendance upon lectures and hospital practice, which, in former years might be accomplished in six months, is now made to extend over a period of three years, and to consist of three winter and two summer sessions. The Court thus restrict the term of actual service as an apprentice to two years; and they argue, and, we think, very justly, that to a youth previously well acquainted with the classics, the elements of the mathematics, and the modern languages, "this period of apprenticeship is by no means of small importance; for, during that time, it is incumbent upon the master to take care that his apprentice keeps up, and extends, by a regular course of reading, both his classical and general knowledge. It is also his duty to ascertain, by occasional examinations, that

his pupil is acquiring the elements of professional knowledge, and that opportunities should be afforded him of watching the progress of disease, and of noticing the effects of remedies." The Court proceed to show that their curriculum has been drawn up in strict conformity with the regulations of the College of Surgeons, so that the two courses required, the one by their own regulations, and the other by those of the College, may be completely harmonized, and the students subjected to no inconvenience in preparing themselves for the diploma and license necessary to enable them to practise their profession. A most important feature introduced into the examination during this year, is the separation of the Latin from the general examination, whereby the student is enabled to pass his Latin test at the commencement of his medical studies at the schools.

No important alteration is now observed during several successive years; and it is generally understood that the Court of Examiners refrained, for some time, from offering any observations upon the subject of medical education, in the expectation that some comprehensive measure of medical reform would receive the sanction of the legislature; but the discussions upon that subject have given rise, unhappily, to the utmost dissension, and have unquestionably retarded the progress of sound education. The minds of the students having been distracted by theoretical questions of medical reform, the attention to accurate scientific principles has been relaxed in proportion; and the public have been the sufferers, in the diminished standard of professional attainments reached by their medical advisers. But as year after year rolled away, and the whole question of medical reform appeared as far as ever from a satisfactory adjustment, the Court of Examiners of the Society of Apothecaries have again, in the year 1850, proceeded to make some very important and beneficial changes in their curriculum. The Latin examination is now held upon a separate day from the general examination; and the student is required not only to translate the language, but to explain its grammatical construction, the object evidently being to encourage a sound knowledge of the language, rather than that parrot-like acquaintance with it which may be acquired by the help of translations and the exercise of mere memory. The pursuit of Practical Chemistry, which was formerly an indefinite appendage to the course of lectures on that subject, is now made a distinct and separate course, and includes the actual instruction of the pupils in the manipulations of the science, in determining the presence of poisons, in analysing gaseous compounds, and in examining the different secretions of the body. We are informed that the student is now examined in Practical Chemistry in the examination-room, by means of tests and other re-agents, which are placed in his hands. Another subject which the examiners have prominently encouraged, is the *study of Clinical Medicine;* and the Court now express their readiness to receive, "in place of a second course of lectures on the theory and practice of medicine, a certificate of attendance on a course of Clinical Lectures, provided such lectures be delivered in a recognised hospital, by a distinct professor, and consist of not less than seventy-five lectures." The object of defining the number of lectures, is stated to be the abolition of the loose and inefficient manner in which clinical lectures have been hitherto given, and to cause a definite system of instruction to be pursued in this most important and essential department of medical science. Another change, which is observable, is the transference of the lectures on Materia Medica and Midwifery from the winter to the summer session; but to this change we by no means yield our cordial approval; for, although the Court state that this alteration was arranged after a conference between the authorities of the College of Surgeons and the Hall, and that it is intended to give the student more time for the study of Anatomy and Chemistry, we yet fear that, under present circumstances, the result will be, to discourage the cultivation of materia medica and of midwifery; departments of medical science of essential importance to the general practitioner.

The Regulations of the College of Surgeons are in striking and remarkable contrast with the Regulations of the University of London and those of the Society of Apothecaries. We do not intend, for reasons given at the commencement of this article, to enter upon the education of the pure surgeon, as he is absurdly called, and we therefore intend to make no remarks upon the Fellowship of the College, or the Regulations which have been issued in regard to it. Our only object, at present, is to shew the relation which the College of Surgeons bears to the general practitioner: and here we may remark, that if the College repudiate and despise general practice, we cannot see why it should continue to examine general practitioners. Let the College become what it professes to be, an institution for the cultivation of pure surgery, and we are willing and anxious to give it our warmest support. We cheerfully admit the distinguished talents of many of its Examiners, Council, and Professors: we admire its magnificent museum, and the assiduity exhibited in its maintenance and enrichment: we applaud the zeal and munificence which have raised its splendid library, nay more, we think that the Government ought to endow so noble a National Institute with sufficient funds to carry out the praiseworthy intentions of its founders. It certainly ought not to be upheld, as at present, by the examination fees of general practitioners. The system is alike injurious to the dignity of the College and the safety of the public. But as the College, while denouncing and ridiculing general practice, actually derives its principal emoluments from the very class which it despises, we are by no means stepping out of the path of fair criticism, when we examine the claims it possesses to confidence and support as an educating and examining body.

In perusing the Regulations of the College of Surgeons of England, from the year 1828 down to the present time, we look in vain for any expression of sympathy for the members of the profession, any indication of a desire for their improvement, or any remarks about their preliminary education. In not one of these Regulations is the subject of classical knowledge ever alluded to in the most distant manner, nor indeed is it hinted in any part, that the College requires any preliminary education whatever. The importance attached by the Council of the College to these and other trifles, is reserved for the Hunterian Orations, when a great deal of fun is excited by the orators, and a great deal of amusement afforded to the Members of Parliament and others of the laity who assemble on those occasions, by the witty allusions made to the people who "wield" the pestle and mortar, who converse with their apprentices in dog-Latin, and who make young gentlemen pay them a large sum for the privilege of brushing their shoes and opening their shop-shutters: then, when the merriment has a little subsided, a serious turn is given to the discourse; the giant evil of the profession is declared to be the want of preliminary education, the orator, however, always forgetting to mention that his own College has, by its culpable negligence, encouraged that very ignorance which it now affects to discover and deplore.

In the Regulations of the College of Surgeons published in 1828, we find that the candidate is required to have completed *his twenty-second year*, and to prove that he has been engaged *six years at least* in the acquisition of professional knowledge, and of having regularly attended three or more winter courses of Anatomy and Physiology, and two or more winter courses of Dissections and Demonstrations delivered at subsequent periods; together with two or more courses of lectures on the principles and practice of Surgery. He is likewise required to prove that he has attended lectures on the Theory and Practice of Physic, upon Materia Medica and Botany, upon Chemistry, and upon Midwifery; and that he has attended, during one year, the surgical practice of certain specified hospitals in England, Ireland, or Scotland.

The examination, we should remark, consisted at that time, of questions in

Anatomy and Surgery; *and it consists of precisely the same subjects at the present day.*

Now these Regulations, considering the time at which they were issued, and notwithstanding the total omission of the slightest mention of preliminary education, are to a certain extent commendable; and those who passed the ordeal may be said to have offered some guarantee as to their competency to practise surgery. We might fairly have expected that the Court of Examiners would, from time to time, have made such alterations and improvements in their curriculum, and in their examinations, as the circumstances of the times, and the increased facilities offered to students, might seem to justify or to suggest. But, to our utter astonishment, the College diminishes its standard of education, in exact proportion to the increasing diffusion of professional knowledge. Thus we find, in the above Regulations, that the student must have spent at least *six years* in the acquisition of professional knowledge; but, in 1835, the College requires him to study only *for five years*, and in 1838, *four years* are considered sufficient. So that in 1828, when the anatomy taught, consisted of little more than a catalogue of the structures of the human body—when surgery was comparatively unformed—when physiology was in its infancy—when comparative anatomy was almost unknown as a distinct branch of science—when pathology and morbid anatomy were generally neglected—when the microscope was only in the hands of the few—when clinical surgery had not yet been taught in this country:—at this period, we say, six years were considered to be necessary for the manufacture of a surgeon; but from 1838 to the present time, when anatomy, general, special, comparative, and morbid; surgery, practical, theoretical, and clinical; physiology, both animal and vegetable, have all advanced with rapid strides, and have swelled the bulk of the student's labours to at least one hundred times their former extent, four years are considered amply sufficient for the purpose! We shall not waste words upon this portion of the Regulations, as its absurdity speaks for itself. Again, the College requires in 1828, that the student who presents himself for examination, shall be twenty-two years of age. Now, there was a very obvious advantage in this Regulation; for as students were allowed to present themselves at Apothecaries' Hall at twenty-one, the extra year was exceedingly well employed in acquiring a more complete knowledge of anatomy, and in attending more closely to hospital practice than could be accomplished while they were learning some of the preliminary branches of knowledge, such as Latin, Pharmacy, Chemistry, Botany, etc.; and independently of this consideration, the age of twenty-two is quite early enough for any man to receive a diploma to practise surgery. But in 1838, we find that the candidate is required to be only twenty-one years of age. We fear the effect of these changes has been mischievous in the extreme; for in former times, the pupil commenced his medical career perhaps at sixteen years of age: for two or three years he probably served an apprenticeship, during which time he acquired a facility of reading prescriptions, of compounding drugs, and of recognising their most striking characters; and he would also be made acquainted with the symptoms of various common ailments, and with, at least, the minor operations and manipulations of surgery. This sketch puts the apprenticeship in the lowest point of view; but where the master was an intelligent and conscientious man, in extensive practice, a large portion of time would be occupied in obtaining from books, and orally, much practical information in connexion with the subjects of interest passing under his daily notice. At eighteen or nineteen, the pupil came to London; he commenced his collegiate or hospital career by studying Anatomy, Physiology, Chemistry, and Materia Medica, and afterwards the other branches of science in their prescribed order. At twenty-one, he was enabled to present himself for examination at Apothecaries' Hall, and was examined, (as every medical or surgical student ought

to be) in Latin, Chemistry, Materia Medica, Practice of Physic, etc.; and as we have just remarked, he had then a whole year for a farther pursuit of the higher branches of Anatomy, Physiology, Pathology, and Surgery, before he could present himself for examination at the College of Surgeons.

Now the student so educated and so examined, was very fairly qualified to practise the profession with credit to himself and with advantage to the public; and the systematic manner in which his studies were pursued, must have had no small influence in the discipline of his mind. But at present, the student may offer himself for examination at the College of Surgeons at twenty-one, and he requires only four years of professional study. When, therefore, a student comes of age, he reflects upon the examination which it is most convenient for him to pass; and if he be totally ignorant of the classics, wholly unacquainted with chemistry, materia medica, and the practice of physic, he *of course* selects the College of Surgeons, upon the strength of a smattering of anatomy and an infinitesimal proportion of surgery. He then issues forth from the stately portals in Lincoln's Inn Fields, with his diploma in his hand, and considers himself lawfully qualified to practise his profession! Now, in all seriousness, ought this state of things to exist? Is a man competent to practise the medical profession upon such slender acquirements as those we have just noticed? Admitting, as we cheerfully do, the immense and paramount importance of anatomy, and the great utility of surgery, are these *all the branches* which a student of the present day ought to acquire? We repeat, that a student may pass the College of Surgeons of London with a smattering of anatomy and a little surgery; and we ask again, is a man so examined fit to practise the profession, in which nine-tenths of the cases he will be called to attend, are purely medical? During the present century, a flood of intellectual light has illuminated the domains of medical science; the brilliant discoveries of Priestley, of Black, of Cavendish, of Davy, have paved the way to that comprehensive science of chemistry, which, interwoven at it is with almost every process either of nature or of art, is more particularly connected with physiology and with medicine, inasmuch as most of the operations of the body, both in health and disease, are governed by its laws. The genius of Laennec, and the labours of the other eminent pathologists of this country and the continent, have brought to light innumerable forms of disease, formerly enveloped in impenetrable obscurity; the researches of practical physicians have revealed a vast variety of remedies calculated to assuage pain, to arrest disease, and to prolong human life; and the science of hygienics has in many cases detected the subtle forms of poison lurking in the waters and in the air; and while it has revealed their presence, it has often baffled or mitigated their malignity. But to not one of these sciences need the candidate for examination at the College of Surgeons give any practical attention; for although it be true, that the College direct him to attend lectures upon some of the subjects, it does not demand any proof that he has understood their meaning, or appreciated their importance; he is merely required to shew that he has paid for the lectures: for if present, he may have been asleep upon the benches, or what is just as probable, may have been absent altogether. The practice and policy of the Royal College of Surgeons of England appears to be, to admit, as members, as great a host as possible, at the *minimum* expenditure of time, and the *minimum* exertion of intellect; and we have no hesitation in expressing our opinion, that *taken by itself*, the diploma of this College is, as a testimonial of professional ability, the *very worst* in the United Kingdom of Great Britain and Ireland; and that the whole proceedings of the College, so far as the general practitioners are concerned, *have been calculated to degrade the medical profession in this country*.[1]

[1] The case of the Taunton pastry-cook (now in practice as a charlatan), may be remembered by our readers. This man, by imposing on the College by forged certificates of study, was received on trial, and of course obtained his diploma!

Strong as this language undoubtedly is, it is quite consistent with the truth; and, indeed, it is curious enough that its justice is admitted by the College itself. In a manifesto published in 1845, it was first announced that the College considered the great bulk of its own members as qualified only for the "ordinary exigencies" of surgical practice! While, as to medical practice, of course, the College never took any trouble in the matter. Now, the plain English of this is, that the College of Surgeons considers its members as qualified to bleed, draw teeth, and set bones, and regards its diploma simply as a certificate of fitness for such manual and mechanical performances. In a manifesto from the College recently published, the same view is maintained, although in language exceedingly ornate, often ambiguous, and always mystical. In this communication, it is not very difficult to discover, that the object is to shew the propriety and expediency of degrading the standard of professional education and examination; and an anxiety is tenderly expressed, that if the standard of qualification be made too high, the remuneration for professional sciences will be thought too low, and the lower orders of people will be compelled to have recourse to the quacks and the druggists. This argument is wholly hypothetical, and entirely fallacious; but as it is somewhat specious and plausible, it requires a few remarks.

In the first place, we may observe, that we never heard of any difficulty being experienced by persons in procuring efficient medical assistance, if they thought proper to seek it. The meanest pauper may procure the attendance of the Union medical-officer; the grade just above the pauper procures relief at the hospitals and dispensaries; and the class who are able to pay a little, may obtain the services of well-qualified practitioners, especially of young men, who rarely display any reluctance to attend for a small remuneration, as the system initiates them into practice, and leads honourably to a better professional connexion.

But, regarding the subject in another point of view, let us ask what would be thought of our universities of Oxford and Cambridge, if they were to reason in the following manner concerning the Church? "We annually send forth from our colleges several hundreds of young men, many of whom will enter the Church of England; now, the mass of these our graduates must necessarily take curacies, and this ill-paid majority will probably pass their lives in preaching the gospel to the coarse bumpkins of a country village—very few can become bishops, deans, or prebends: *therefore*, let us alter our system, let us create an intellectual aristocracy of the profession—let us examine the select class in Latin, Greek, Hebrew, and mathematics; but, as the rest are only to exercise the ordinary duties of country curates, let us relax our regulations so far as they are concerned, let their examination be merely nominal, and the real examination be reserved for those who are to occupy the higher walks of the profession." But the universities never reasoned in so criminal a manner, or ever proposed so shameful a scheme; they very properly fix a standard which is uniform for all their candidates, and the country curate knows that he has passed the very same kind of examination as the bishops and the archbishops.

Again, it has been argued, that if the qualifications for a profession be raised too high, the difficulty of obtaining them will deter so many from the pursuit, that an insufficient number will be found to supply the wants of the community. Now this argument is proved to be entirely fallacious, by the most positive evidence; for it was found, that when the Court of Examiners of the Society of Apothecaries gradually extended their curriculum, and were progressively rendering their examination more and more difficult, the number of registered students *was annually increased*. Again, we conceive, that no one will accuse our universities of undue laxity in the granting of degrees to those, who are to become ministers of the Church. It is well known, that the education for the duties of the ministerial office is both expensive and laborious, and yet the number of clergymen is enormous; and that *emolument* is not the only object

which can induce so many to enter the Church is evident from the fact, that several thousands of the clergy have salaries under £100 a-year.

Let us now gather together the substance of the preceding pages. There are three examining institutions in London, connected with the general practice of this country: the University of London, which examines, searchingly and efficiently, in every branch of medical as well as general science; the Society of Apothecaries, which, as far as the act of Parliament will allow, examines efficiently in Medicine, Chemistry, Anatomy, and Materia Medica; and the College of Surgeons, which examines most inefficiently in Anatomy and Surgery. The first enforces a preliminary examination, of a very comprehensive character, from those who are to become its graduates; the second requires, at least, a knowledge of the Latin language, to be evinced by parsing and translating certain Latin classical authors; the third, unlike any other collegiate institution in the civilized world, requires no preliminary education at all.

Notwithstanding the present confused and chaotic state of medical education, much might be done for its improvement by a very slight alteration of existing laws and privileges. The University of London, having the complete power of examining in all departments both of general and medical education, might very fairly be resorted to by all ambitious students of medicine, whatever branch of the profession they may intend to pursue; and if it be answered, that the emoluments of the corporations would suffer by such a system, it might be conceded to those who possess the University degree, that they should obtain their license to practise upon the payment of the fees, and upon passing a merely nominal examination. For those, however, who do not possess the University degree, we would make it compulsory that they should obtain the license of the Apothecaries' Company, and the diploma of the College of Surgeons. *With only one of these testimonials, no person should be licensed to act as a general practitioner.* We would also make it compulsory, that no person whatever should receive the diploma of the College of Surgeons, without giving proof that he possesses some classical and general knowledge.

The license of the Apothecaries' Company by no means entitles a man to practise, either legally or morally, all the branches of the medical profession, because surgery is necessarily (owing to the terms of the act of parliament) excluded altogether from the curriculum, and from the examination; and the science of midwifery does not meet with the consideration to which it is entitled. But imperfect as the education enforced by the Society of Apothecaries undoubtedly is, it is infinitely superior to that enjoined by the College of Surgeons, which sends forth its members upon the strength of a little anatomy and less surgery (which may be picked up, *and often is picked up*, in a few months), to practise all the branches of the profession, if not at home, yet in the army, the navy, the East India Company's service, and in the colonies; although the members so licensed may be, and very often are, wholly ignorant of medicine, midwifery, chemistry, materia medica, and botany.

Therefore we argue, that as long as the present corporations continue to exist, the general practitioner ought only to obtain his license to practice, after passing the examination both of the College and of the Hall. The examinations ought to be divided, and a preliminary examination should be instituted *for all students whatever.* The Apothecaries' Hall might relinquish examination in anatomy and physiology; and on the other hand, the examination of the College of Surgeons should not be hurried over in an hour, but be made *a really good and efficient one,* comprehending a thorough investigation of the candidate's acquirements in anatomy, physiology, pathological anatomy, and surgery. This plan would not only be decidedly useful to the College in a pecuniary view, but it would likewise be beneficial to all parties; for we consider, that the present system of sending forth a host of half-educated

men is highly injurious to the social status of our profession; and unsafe to the public, who are not aware that a member of the College of Surgeons is only examined in Anatomy and Surgery.

Our desire is not to destroy existing institutions, but to urge the necessity of fortifying their weak points, and of rendering them fit for the age we live in. In conclusion, we would remark, that our silence in these articles regarding the Scotch and Irish Colleges, has not arisen from an insensibility to their importance, but simply from a desire not to obscure striking facts by complicated details.

THE TREATMENT OF SECONDARY, CONSTITUTIONAL, AND CONFIRMED SYPHILIS, BY A SAFE AND SUCCESSFUL METHOD, WITH NUMEROUS CASES AND CLINICAL OBSERVATIONS. By LANGSTON PARKER, Surgeon to the Queen's Hospital, and Professor of Anatomy and Physiology in Queen's College, Birmingham. London: 1850.

The present work is not intended, says the author in his preface, to illustrate the nature and the varieties of Syphilitic Diseases, but to point out an easy and efficacious way of curing them. This method consists in mercurial fumigations, a plan not altogether new, but one which has fallen into perhaps unmerited neglect. The "mercurial vapour bath" is thus described by the author. "The method I employ consists in surrounding the patient with an atmosphere of mercurial vapour in a moist state. It has all the advantages attributed to the best conducted, most successful, and least hurtful mercurial treatments conducted in the ordinary modes; it has none of their disadvantages; it neither produces mercurial fever, salivation, ulcerations of the mouth, erethism, debility, or any form of cachexia, so common from prolonged ordinary mercurial treatments. It has the superior advantages of effecting speedy and permanent cures, without confinement and without risk.

"The patient is placed on a chair, and covered with an oil-cloth, lined with flannel, which is supported by a proper framework. Under the chair are placed a copper bath, containing water, and a metal plate, on which is put from one to three drachms of the bisulphuret of mercury, or the same quantity of the grey oxide or the binoxide. Under each of these is a spirit lamp. The patient is thus exposed to the influence of three agents, heated air, common steam, and the vapour of mercury, which is thus applied to the whole surface of the body in a moist state. After the patient has remained in the bath from five to ten minutes, perspiration generally commences; and by the end of twenty or thirty minutes, beyond which I do not prolong the bath, it is generally excessive. The lamps are now removed, and the temperature gradually allowed to sink: when the patient has become moderately cool, the coverings are removed, and the body rubbed dry: the patient is suffered to repose in an arm-chair for a short time, during which he drinks a cup of warm decoction of guaiacum, sweetened with syrup of sarsaparilla." (p. 4.)

"I am in the habit of using four mercurial preparations for the bath; the bisulphuret of mercury, the grey or black oxide, the binoxide of mercury, and the iodide. These may be used singly or combined in different ways, to suit the peculiarities or emergencies of each particular case. The first three preparations are milder than the last, and from half a drachm to four drachms may be used with perfect safety. In one case, half an ounce was used for each bath, and two applications were sufficient to bring the system fully under the influence of the remedy. The iodide must be used in smaller quantities: nearly the whole of this preparation is rapidly converted into vapour, and, unlike all the other preparations, leaves scarcely any ash behind it. From five grains to half a drachm of the iodide is sufficient, and it is better to use it in small quantities, mixed with a larger proportion of either of the other preparations. In affections of the testes (sarcocele), and of the bones (the various forms of ostitis or periostitis), a combination of a scruple of the iodide, and one or two drachms of the bisulphuret or binoxide, would be a proper form. For

local application to the cavities of the nose or mouth, a few grains only should be employed, as the vapour of the iodide of mercury is more irritating and more powerful than that of either of the other preparations I have mentioned." (p. 7.)

Mr. Parker illustrates his treatment, by the record of thirty-two cases in which the mercurial bath was employed with marked success. The only objection to the plan, appears to us to be the inconvenience of its adoption in private practice; but in hospitals, where the requisite apparatus can be kept always in readiness, we have no doubt of its efficacy. As we are among those who think that a moderate mercurial treatment is sometimes necessary, or at least is the best method of treating certain cases and forms of syphilitic disease, (both primary and subsequent), and as we believe the endermic to be a very speedy and a very efficient method of administering remedies, we commend this little book to the favourable notice of our readers.

An Account of some Discoveries relative to Consumption. By John Gardner, M.D., Fellow of the Chymical Society, Founder of the Royal College of Chymistry, Editor of Liebig's Letters, and Lecturer on Organic Chymistry, etc. Pamphlet, pp. 43. London: 1850.

We have serious doubts as to the propriety of even noticing this pamphlet. When an author studiously insults the profession to which he belongs, making parade of his choice of the public for his audience, avowedly by reason of the presumed *ignorance* of his professional brethren, he can scarcely complain if his lucubrations meet with the contemptuous silence they deserve. We shall, however, put our readers in possession of what Dr. Gardner proclaims as his discovery: and that we may not be suspected of misrepresentation, we shall quote his own words.

"Amid this diversity of causes, general and local, is there any common circumstance or condition traccable, which is the first step towards the production of consumption—the first link in the chain of morbid actions?—the primary proximate cause of the disease? There is. It consists in the formation of a ζύμη, a leaven, or *ferment*, by an incipient, putrefactive process, a molecular change, the transformation of a portion of albuminous matter, which first leads to its self-propagation, and afterwards, or simultaneously, determines the formation of tubercle. This is the key-truth to a just theory of Consumption", etc. (p. 31.)

"When, therefore, by the operation of those general causes above enumerated, the ζύμη, or ferment, is produced in any part of the body, it is conveyed by the blood-vessels into the lungs, and there permeating or exerting its influence through the membranous septa (known to be amongst the most delicate in the body), a chymical change, or transformation, is set up, the albumen in the loose, spongy texture of the lungs is ready, and tubercle is formed; which being an insoluble compound, is there detained, and undergoes further changes, softening, etc., more nearly approaching, in fact, towards absolute putrefaction." (p. 33.)

The presence of this ζύμη, we are told, can be ascertained by chemical analysis of the secretions, including the expired air,—*how* we are not yet informed, the revelation of this, and of the *cure*, being reserved for a future pamphlet. Cautious reticence! Our readers will at once perceive, that the *idea* involved in Dr. Gardner's expositions is not new. Dr. Madden, in his recently published work, argued strongly in favour of the dependence of Phthisis on a special morbid poison; and the same has been more or less distinctly hinted at by some other observers.

The pamphlet being intended for the *public*, that same learned body is favoured with translations of various technicalities: *e.g.*, Emphysema *(i.e., air entangled in the texture of the lungs.)* Pulmonary apoplexy *(i. e., fulness of blood).* Aneurism of the aorta *(i. e., tumour upon a great blood-vessel).* We trust the public will be duly grateful for this accession to its available knowledge.

A Manual of Elementary Chemistry, Theoretical and Practical. By George Fownes, F.R.S. Third Edition. pp. 605. London: 1850.

The study of Chemistry is of paramount importance in the investigation of disease; and we may safely assert that no one can now arrive at eminence in the medical profession, who is not acquainted with that science. All the functions of the human body are governed by chemical laws; and, although their exact nature is still in some measure concealed from our view, enough has been done of late years to encourage us to farther attempts in this most ample field of inquiry. Believing as we do, that a knowledge of Chemistry is indispensable to every student of medicine or surgery, we hail with pleasure the appearance of the work before us, as being well suited to facilitate the acquisition of a competent knowledge of this science. The work of Dr. Fownes has long been before the public, and its merits have been fully appreciated as the best text-book on Chemistry now in existence. We do not, of course, place it in a rank superior to the works of Brande, Graham, Turner, Gregory, or Gmelin, but we say that, as a work for students, it is preferable to any of them. The time allotted to most students for acquiring a knowledge of their profession, is too short to allow them to master elaborate treatises; and therefore many of the manuals lately published, are exceedingly useful, in giving a condensed view of the more prominent and essential departments of medical science. If the student were, during his attendance on lectures, to make himself thoroughly acquainted with Dr. Fownes's manual, and at the same time to perform for himself many of the experiments which are therein described, he would thus acquire a knowledge of Chemistry, which would be of infinite service to him in after-life.

The present edition differs but little from its predecessors; but, as a warranty of its being on a level with the present state of Chemistry, we may state that Dr. Bence Jones has corrected the press, and made the few alterations and additions which were necessary.

A Practical Handbook of Medical Chemistry. By John E. Bowman, Demonstrator of Chemistry in King's College, London. pp. 276. London: 1850.

This well written work of Mr. Bowman's, treats of the Practical Applications of Chemistry to Medicine. One great feature is, that the microscopical appearances presented by various organic substances, are, in it, faithfully delineated. The work consists of 246 pages, of which, 166 are occupied by the chemical and microscopical characters of the blood and urine; and we cannot too highly commend the very elaborate, yet clear and distinct manner, in which the appearances of these fluids, and their variations in disease, are described.

Mr. Bowman's work is not calculated for the beginner; but the student who has made himself master of the principles of Chemistry, will peruse it with pleasure and advantage. To the practitioner, the book is to be specially recommended, as giving a very clear account of many chemical matters, which must be ever coming before him in his daily practice. Every practitioner, and every student of clinical medicine, should endeavour to enrich his collection of books by adding to their number Mr. Bowman's little volume.

CLASSIFIED CATALOGUE OF THE PAPERS WHICH HAVE APPEARED IN THE BRITISH AND FOREIGN MEDICAL PERIODICALS FROM JANUARY 1849.

In fulfilment of our promise, we commence our CLASSIFIED CATALOGUE of the papers which have appeared in the British and Foreign Medical Journals since the commencement of 1849. The portion given this month consists of the articles on Pathology and Medicine, contained in most of the British and American Journals. As we wish to render this Catalogue, in connexion with our elaborate Indices, a perfect key to the Medical Literature of the World, we have to request our readers to inform us of any errors or omissions which they may discover in this or subsequent chapters.

CHAPTER I.

PRACTICE OF MEDICINE AND PATHOLOGY: BRITISH AND AMERICAN JOURNALS, FROM JAN. 1849 TO JUNE 1850.

BY ALEXANDER HENRY, M.D.

The following is a list of the Periodicals, with the abbreviations used in referring to them :—

London Journal of Medicine	Lond. Journ. of Med.
Medico-Chirurgical Transactions	Med.-Chir. Trans.
British and Foreign Medico-Chirurg. Review.	B. and F. Rev.
Lancet	Lancet.
Medical Gazette	Med. Gaz.
Medical Times	Med. Times.
Journal of Psychological Medicine...	Journ. Psych. M.
Provincial Medical and Surgical Journal ...	Prov. M. and S. Journ.
Edinburgh Medical and Surgical Journal ...	Edin. Med. and Surg. J.
Monthly Journal of Medical Science	Edin. Month. Journ.
Dublin Quarterly Journal	Dub. Quart. J.
American Journal of Medical Science	Amer. Journ. of Med. Sc.
Philadelphia Medical Examiner	Phil. Med. Ex.
Transactions of American Medical Association.	Amer. Trans.

CONGENITAL MALFORMATIONS.

MALFORMATION of Cranium, Encephalon, and Spinal Chord. DALTON (J. C.) Amer. Journ. of Med. Sc., April 1850, vol. xix, N. S., p. 340.

CONGENITAL Deficiency of Superior Portion of Cranium. TRUGIEN (J. W. H.) *Ibid.*, Oct. 1849, vol. xviii, N. S., p. 407.

——————— of Posterior part of Cranium and Spinal Column : Deformity of Genital Organs, etc. BREED (J. E.) *Ibid.*, p. 408 (wood-cuts).

ACEPHALOUS Monster born at the full period of Pregnancy. HARVEY (Mr.) Lond. Journ. of Med., Oct. 1849, vol. i. p. 974.

THORACIC and Abdominal Viscera, case of Transposition of. CLAPP (W.) Med. Gaz., Jan. 25, 1850, vol. xlv, p. 145.

VISCERA, case of Congenital Malformation of. CHARD (O. E. P.) Med. Times, Feb. 2, 1850, vol. xxi, p. 75.

URINARY BLADDER, Congenital Extrophy of. MACKAY (Dr.) Edin. Month. Journ., July 1849, vol. iii, N. S., p. 934. Abs. in Lond. Journ. of Med., August 1849, vol. i, p. 789.

——— case of Congenital Extrophy of. JONES (John). Prov. M. and S. Journ., Jan. 9, 1850, p. 10.

DISEASES OF THE BLOOD, AND OF THE NUTRITIVE AND EXCRETORY FUNCTIONS.

ANÆMIA and its Consequences: Enlargement of the Thyroid Gland and Eyeballs. Anæmia and Goitre—are they related? BEGBIE (James). Edin.

Month. Journ., Feb. 1849, vol. iii, N. S., p. 495. Abs. in Lond. Journ. of Med., March 1849, vol. i, p. 273.

Anæmia and Goître, Protrusion of the Eyes in connexion with. Cooper (White). Lancet, May 26, 1849, p. 551. Abs. in Lond. Journ. of Med., July 1849, vol. i, p. 658.

——— and Dyspepsia, followed by Hæmatemesis, Clinical Lect. on. Walshe, (W. H.) *Ibid.*, March 31, 1849, p. 331.

Inflammation, unhealthy, Essay on. Gallwey (M. B.) *Ibid.*, vol. ii, 1849, pp. 307, 418, 472, 549, 571, 655.

Hæmorrhage, Observations on. Neligan (J. Moore). Dub. Quart. J., May 1850, vol. ix, N. S., p. 347.

Dropsy, Clinical Lectures on. Todd (R. B.) Med. Gaz., 1849, vol. xliii, pp. 309, 582.

Blood, unusual number of White Corpuscles in, in connexion with Enlarged Spleen, Clin. Lec. on Case of. Parker (E. A.) Med. Times, June 15, 1850, vol. xxi, p. 431. Abs. in Lond. Journ. of Med., July 1850, vol. ii, p. 691.

Exudation, and Elementary Forms of Morbid Products, Preliminary observations on. Clark (A.) Med. Gaz. 1849, vol. xliii, pp. 448, 490.

——— Simple, Cancerous, and Tubercular; their Pathology and General Treatment (numerous wood-cuts). Bennett (J. Hughes). Edin. Month. Journ., Feb. 1850, vol. i, 3rd S., p. 149.

Steatosis: or Adipification of Muscle. Hallett (C. H.) Edin. Med. and Surg. J., April 1849, vol. lxxi, p. 257. Abs. in Lond. Journ. of Med., May 1849, vol. i, p. 489.

Tuberculosis, intense acute general, with Perforation of Stomach. Beneke (W.) Lancet, Dec. 22, 1849, p. 664.

Obesity, remarks on. Wardell (J. R.) Med. Gaz. 1849, vol. xliii, pp. 494, 535, and 589.

Carcinomatous Lesions, contributions to the Pathology of. Black (J.) *Ibid*, July 6, 1849, vol. xliv, p. 21.

Animal Chemistry, Course of Lectures on, specially illustrating the Diagnosis and Treatment of Stomach and Renal Disease. Jones (H. Bence). Lancet, vol. i, 1850, pp. 1 (Truth in Medicine), 37 (Food), 69 (Digestion), 103 (The Blood), 137 (Calculi), 164 (Quantity and Acidity of the Urine), 197 (Uric or Lithic Acid), 225 (Oxalate of Lime and Sulphates; Sulphuric Diathesis, or Excess of Sulphates in the Urine), 259 (Alkaline and Earthy Phosphates), 287 (Alkalescence of the Urine), 324 (Albuminous Urine; Microscopic Appearance of the Urine in Bright's Disease), 349 (Diabetes and Diuresis), and 375 (Relation of the Urine to the Food and System; Method of Examining the Urine).

Acidity and Alkalinity of certain Liquids of the Human Body, in Health and Disease. Andral (M.) Edin. Med. and Surg. J., Jan. 1850, vol. lxxiii, p. 124. From Ann. de Chimie et de Physique, 3me Série, tome xxiv, p. 116. Paris: 1848.

Urine, Oxalate of Lime Crystals in. Walshe (W. H.) Edin. Month. Journ. Jan. 1849, vol. iii, N. S., p. 453.

——— Vesicles and Torulæ in. Thomson (Spencer). Med. Times, March 16, 1850, vol. xxi, p. 194.

——— Total Suppression of, during Seven Days, terminating in Recovery. Oke (W. S.) Prov. M. and S. J., May 16, 1849, p. 259. Abs. in Lond. Journ. of Med., June 1849, vol. i, p. 580.

——— Suppression of. Hall (J. C.) Lancet, vol. i, 1849, pp. 581 and 631, and vol. ii, p. 4. Abs. in Lond. Journ. of Med., Aug. 1849, vol. i, p. 750.

Gout and Rheumatism, connexion between. Garrod (A. B.) Lond. Journ. of Med., June 1850, vol. ii, p. 583.

Rheumatism, Acute, with Arachnitis and Pericarditis, supervening on Chronic Arachnitis and a remarkably Diseased Heart. Ancell (H.) Edin. Month. Journ, Jan. 1849, vol. iii, N. S., p. 446.

——— case of, with Pericarditis, etc., Clinical Lecture on. Walshe (W. H.) Lancet, Feb. 10, 1849, p. 141.

Rheumatism, case of, followed by Pleurisy, Clinical Lecture on. Walshe (W. H.) *Ibid.*, April 14, 1849, p. 387.

——— Nitrate of Potash in; with Suggestions for the use of External Saline Applications in Chronic Rheumatism. Basham (W. R.) Med.-Chir. Trans., 1849, vol. xxxii, p. 1; Lond. Journ. of Med., Jan. 1849, vol. i, p. 106.

Rheumatic Gout, case of, treated by Lemon-juice. Rees (G. O.) Med. Gaz., Jan. 26, 1849, vol. xliii, p. 156.

Diabetes, case of in a Child. Parsons (J.) Prov. M. and S. Journ., June 27, 1849, p. 342.

——— Mellitus, Perforations and other Lesions of the Stomach connected with. Macintyre (W.) Lond. Journ. of Med., May 1849, vol. i, p. 501, and April 1850, vol. ii, p. 353.

——— Treatment of: Substitute for Bread. Percy (John). Lancet, March 17, 1849, p. 289. Abs. in Lond. Journ. of Med., April 1849, vol. i, p. 379.

Scurvy, Observations on, in Bath and its neighbourhood, in the Spring of 1847. Barrett (John). Prov. M. and S. Journ., March 21, 1850, pp. 148, 173, 211.

——— Digest of Memoirs on, by Anderson (A.), Baly (Dr.), Bellingham (Dr.), Chatin et Bouvier (MM.), Christison (Dr.), Curran and Aldridge (Drs.), Fauvel, Becquerel, and Rodier (MM.), Foltz and Frick (Drs.), Garrod (Dr.), Laycock (Dr.), Lonsdale (Dr.), Ritchie (Dr.), Shapter (Dr.), Stiff (Dr.). Lond. Journ. of Med., Feb. 1849, vol. i, p. 181.

——— at York Factory, Hudson's Bay. Smellie (William). Edin. Month. Journ., Sept. 1849, vol. iii, N. S., p. 1061.

——— respective value of Lime-juice, Citric Acid, and Nitrate of Potash, in the Treatment of. Bryson (A.) Med. Times, 1850, vol. xxi, pp. 212 and 435.

Goître, cases of, with Observations. Alison (Scott). Lond. Journ. of Med. June 1849, vol. i, p. 518.

Glanders from Infection. Kelly (Dillon). Dub. Quart. J., Nov. 1849, vol. viii, N. S., p. 442.

DISEASES OF THE SKIN.

Skin, Contributions to the Pathology of. Burgess (T. H.) Med. Gaz., 1849, vol. xliii, pp. 315, 412, 595, 758, 933; vol. xliv, p. 314.

Skin-Diseases, Pathology and Treatment of. Neligan (J. Moore). Dub. Quart. J., Nov. 1849, vol. viii, N. S., p. 340.

——— Classification and Diagnosis of. Bennett (J. Hughes). Edin. Month. Journ., April 1850, vol. i, 3rd S., p. 345.

——— on the Treatment of some: (viz., Psoriasis and Lepra). Griffith (S.) Lancet, May 26, 1849, p. 559.

——————— Action of Acetate of Potash in. Easton (J. C.) Edin. Month. Journ., May 1850, vol. i, 3rd S., p. 422.

Eczema and Impetigo, Local Treatment of Chronic. Bennett (J. Hughes). Edin. Month. Journ., Aug. 1849, vol. iii, N. S., p. 963. Abs. in Lond. Journ. of Med., Sept. 1849, vol. i, p. 793.

Ringworm, or Trichophyton Tonsurans. Malmsten (P. H.) Edin. Med. and Surg. J., Jan. 1850, vol. lxxiii, p. 50. From Müller's Archiv., 1848, p. 1.

Erythema Nodosum, and its connection with the Rheumatic Diathesis. Begbie (Dr.). Edin. Month. Journ., May 1850, vol. i, 3rd S., p. 487.

Spedalskhed of Norway. Danielssen (D. C.), and Boeck (C. W.) B. and F. Med. Chir. Rev., Jan. 1850, p. 171. An Analytical Review of the Norwegian Works on the above Disease, which is allied to Elephantiasis.

Elephantiasis in Tracadie, New Brunswick, Essay on. Bayard (R.) Lancet, vol. ii, 1849, pp. 225, 256.

FEVERS.

Fever, Irish Epidemic, especially as it prevailed in 1847-48. Dub. Quart. J., February, May, August, and November 1849, vol. vii, N. S., pp. 64 and

340, and vol. viii, pp. 1 and 270. This elaborate and valuable report consists of original papers by numerous observers in different parts of Ireland, arranged and digested by the Editor.

FEVER, Edinburgh, of 1843-44. CORMACK (John Rose). Med. Gaz., April 13, 1849, vol. xliii, p. 653. Abs. in Lond. Journ. of Med., May 1849, vol. i, p. 492.

——— in the Coleraine Union Workhouse, and in the Union, co. Londonderry, Ireland, in 1847 and 1848. BABINGTON (T. H.) Med. Gaz., Dec. 7, 1849, vol. xliv, p. 962.

——— in South Wales. MASSY (Tuthill). Dub. Quart. J., Nov. 1849, vol. viii, N. S., p. 438.

——— in the Garrison of St. Ann, Barbados. DAVY (John). Edin. Med. and Surg. J., October 1849, vol. lxxii, p. 277.

——— Endemic, of Ceylon, Practical Remarks on. CAMERON (J. C.) *Ibid.*, Jan. 1849, vol. lxxi, p. 70.

——— Lectures on. MACILWAIN (George). Med. Times, 1849, vol. xix, pp. 207, 227, 263, 283, 299, 331, 351, 427, 485, 543, 599; vol. xx, p. 46.

——— Patients, Distribution of, in a Hospital. CHRISTISON (R.) Edin. Month. J., March 1850, vol. i, 3rd S., p. 282.

——— Case of Slow Action of the Heart in. HALPIN (Chas.) Dub. Quart. J., May 1849, vol. vii, N. S., p. 501.

——— Tropical, Contributions to the Pathology and Treatment of. BIRD (James). Lond. Journ. of Med., Jan. & Feb. 1849, vol. i, pp. 43 & 152.

——— Continued, a Series of Papers on the Causes and Nature of. TODD (George). Lancet, vol. i, 1849, pp. 8, 200, 453, 690; vol. ii, pp. 229, 453, 658.

——— Atonic Continued, Clinical Lecture on. WALSHE (W. H.) *Ibid.*, Feb. 24, 1849, p. 193.

——— Typhus and Typhoid: An attempt to determine the Question of their Identity or Non-identity, by an Analysis of the Symptoms, and of the Appearances found after Death in sixty-six fatal cases of Continued Fever, observed at the London Fever Hospital from January 1847 to February 1849. JENNER (William). Edin. Month. Journ., April, May, June, August, October, and Dec. 1849, vol. iii, N. S., pp. 663, 726, 816, 954, 1095, 1264; also Feb. and April 1850, vol. i, 3rd S., pp. 106 and 308.

——— Typhus, Typhoid, Relapsing, and Febricular, the Diseases commonly confounded under the name Continued Fever: illustrated by cases collected at the Bed-side. JENNER (William). Med. Times, 1849, vol. xx, pp. 401, 418, 456; and 1850, vol. xxi, pp. 15, 113, 135, 233, and 433.

——— Typhus or Ship-Fever, in America, Report on. Amer. Trans., 1849, vol. ii, p. 135.

——— Typhus, at Bellevue, New York. REESE (D. M.) Amer. Journ. of Med. Sc., Jan. 1850, vol. xix, N. S., p. 95.

——— Typhoid. UPSHUR (G. L.) Phil. Med. Ex., Oct. 1849, vol. v, N. S., p. 576.

——— Typhoid, Diagnosis of: Chemical and Physical Characters of the Stools considered as Aids to Diagnosis. PARKES (E. A.) Med. Times, June 1, 1850, vol. xxi, p. 395.

——— Typhoid, Account of an Epidemic of, which prevailed in Bath during Sept. and Oct. 1849. DAVIES (William). Prov. M. and S. Journ., Feb. 6, 1850, p. 60.

——— Cerebro-Spinal Typhus, or Meningitis, cases of. SARGENT (Josh.) Amer. Journ. of Med. Sc., July 1849, vol. xviii, N. S., p. 35.

——————— occurring during the prevalence of Epidemic Catarrhal Fever. SCRUGGS (R. L.) Phil. Med. Ex., Jan. 1849, vol. v, N. S., p. 17.

——————— in America, Report on. Amer. Trans., 1849, vol. ii, p. 152.

——— Bilious, as it prevails in the Eastern portion of New Jersey, U.S. FITHIAN (J.) *Ibid.*, 1849, vol. ii, p. 203.

——— Yellow, in New Orleans, in 1848, Report on. *Ibid.*, 1849, vol. ii, p. 159.

Fever, Yellow, in Staten Island, in 1848, Report on. *Ibid.*, 1849, vol. ii, p. 162.
——— Yellow (supposed) in Natchez, Mississipi, U.S., in 1848, Repprt on. *Ibid.*, 1849, vol. ii, p. 164.
——— Intermittent, Observations upon. Harvey (William). This paper is reprinted from the MS. Memoirs of the Dublin Medico-Philosophical Society, vol. iii, p. 236. It was read at a meeting of that Society on the 1st of Aug. 1782. Dub. Quart. J., Nov. 1849, vol. viii, N. S., p. 455.
——— Intermittent and Remittent, Etiology of. Gayley (James F.) Amer. Journal of Med. Sc., Jan. 1849, vol. xvii, p. 53.
——— Miasmatic, and Pulmonary Consumption, alleged antagonism of. Boudin, Green (Horace), and Helfft. Edin. Med. and Surg. J., April 1849, vol. lxxi, p. 344.
——— Intermittent, on the use of Tartar Emetic in. Moore (Mr.) Med. Gaz., Sept. 11, 1849, vol. xliv, p. 445.
——— Intermittent, treated by Turpentine with Castor Oil. Ward (N.) Amer. Journ. of Med. Sc., Oct. 1849, vol. xviii, N. S., p. 548.
——— Infantile Remittent, case of, terminating in Hydrocephalus; Urea in Blood. Cormack (John Rose). Lond. Journ. of Med., Oct. 1849, vol. i, p. 920.
——— Remittent, Quinine in. Parrish (Dr.), Jewell (Dr. W.), Bell (Dr.), Jackson (Dr. S.) Phil. Med. Ex., Feb. 1850, vol. vi, N. S., p. 78.
——— Puerperal. See the chapter on Diseases Peculiar to Women.
Cholera, Review of Books and Pamphlets on. Lond. Journ. of Med., Jan., April, Dec. 1849, vol. i, pp. 72, 339, and 1115.
——— Analysis of Pamphlets on. Lancet, vol. ii, 1849, pp. 14, 94, and 149.
——— Review of Works on. Med. Gaz., Jan. 12, 1849, vol. xliii, p. 64.
——— Review of Books and Memoirs on. Edin. Med. and Surg. J., July 1849, vol. lxxii, p. 197.
——— Review of Memoirs on. Edin. Month. Journ., Jan. 1849, vol. iii, N. S., p. 469.
——— Review of Treatises on. Amer. Journ. of Med. Sc., Oct. 1849, vol. xviii, N. S., p. 437.
——— Progress of Asiatic. Graves (Robert J.) Dub. Quart. J., Feb. 1849, vol. vii, N. S., p. 1. There is a postscript to this paper at p. 242 of the same number.
——— Reports and Statistical Tables of, at the Hospital of St. Giles in the Fields in 1832. Pinckard (R.) Lond. Journ. of Med., April 1849, vol. i, p. 397. (Paper read at Medical and Chirur. Soc., with discussion.)
——— in London, from March 30th to Sept. 29th, 1849. Webster (John). *Ibid.*, Nov. 1849, vol. i, p. 992.
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CRITICAL DIGEST OF THE BRITISH AND FOREIGN MEDICAL JOURNALS.

ANATOMY AND PHYSIOLOGY.

DISCOVERY OF CASEIN IN THE BLOOD.

The following is a translation of a highly interesting paper by Dr. Panum, published in the *Bibliothek for Læger* for January 1850.

Dr. Panum's Memoir. On the 14th of last October, on pouring some blood-serum into a glass of water, I found with surprise that the mixture became whitish and opaque, like diluted milk and water. The same phenomenon occurred, when I used distilled water; hence it could not depend on the presence of saline matters. The opacity began to appear, when there were about four parts of water to one of serum; and it gradually increased till ten parts of water had been added. After this, the liquid remained of nearly the same colour, notwithstanding the gradual addition of ten other parts of water. On allowing the opaque liquid to stand for twenty-four hours, a pretty copious white sediment was precipitated, which could be collected on good filtering paper, while the fluid portion passed through quite clear. A very small quantity of acetic acid dissolved the precipitate, as did also the caustic alkalies and their carbonates: it was insoluble in water, cold alcohol, and ether. Ferrocyanide of potassium threw down a precipitate from the solution in acetic acid; this precipitate, when collected in a filter and washed with distilled water, soon became a transparent, yellowish, very tough, and glutinous mass; and, by further drying, it became hard, brittle, and glistening on the external surface, as well as on that of a broken portion. On being triturated, it produced a white powder: when burnt on a platina plate, it was dissipated, with a strong smell of burnt horn, leaving only a small quantity of incombustible salts. Under the microscope, the sediment appeared as an amorphous granular mass, like albumen coagulated by alcohol. The clear liquid which remained, had an alkaline reaction, and contained a quantity of albumen, which was precipitated by boiling. It was, therefore, evident, that the sediment thrown down on adding water to the serum—being insoluble in water, ether, and cold alcohol, and being precipitated from its solution in acetic acid by ferrocyanide of potassium—possessed the characters of a coagulated protein-compound.

The patient, whose serum manifested the above-mentioned phenomena, was suffering from epiglottitis, and shortly after had the operation of tracheotomy performed. His urine contained, for a short period, a pretty considerable quantity of albumen; the effect, probably, of a large blister, which was applied to his neck. As I had previously, in several patients labouring under Bright's disease, found the serum of very low specific gravity, and opaque from the presence of the so-called "molecular fibrin of Simon and Scherer", I suspected that opacity of the serum and water, and the molecular fibrin, might have one and the same origin. It was indeed probable, that this opacity in the serum, from molecular fibrin, arose from an unusual attenuation. It was also probable, that this material, which sometimes appeared distinctly in the blood, and at others was manifested on the addition of water, might bear a certain relation to the phenomena of Bright's disease. The alteration in the renal secretion might produce a simple deposition of this material in the urinary passages, and hence give rise to the degeneration of the kidneys peculiar to the disease.

A great number of observations soon convinced me, that the grey colour, produced by the mixture of serum with water, far from being a peculiarity attendant on Bright's disease, was observed in the numerous cases in which impoverishment of the blood was conspicuous ; and *that in no case could serum, when mixed with about ten parts of water, be observed, either immediately, or after being exposed to the air for some hours, not to be rendered opaque, by the separation of a protein-compound,* which in all respects behaved as in the case above-mentioned.

In some instances, when the opacity did not immediately appear on mixing serum with distilled water, it became perceptible when the mixture had stood for some time, (from a few hours to a day), exposed to the free access of air ; and in all instances, where the opacity appeared at once, it increased under the influence of the atmosphere, and more especially when I breathed air from the lungs into the liquid. In order to determine which of the constituents of the atmosphere, oxygen or carbonic acid, produced the precipitate in so remarkable a manner, I constructed an apparatus, by which I could subject the serum to the action of a current of air deprived of its carbonic acid by means of lime water ; and, by means of another apparatus, I subjected it to the action of carbonic acid, procured from chalk and hydrochloric acid, and washed with water. The serum, which was subjected to the action of air deprived of its carbonic acid, underwent no change, and gave only a slight greyish tint on being mixed with ten parts of water, in the same manner as normal serum, hermetically closed immediately after a venesection. On the other hand, the serum through which I had transmitted a stream of carbonic acid, became, on being mixed with water in the same proportions, perfectly opaque, almost like milk, and quickly deposited, on standing, a very copious sediment, which was acted on by re-agents in the same manner as has been already mentioned. On carefully adding acetic acid to the diluted serum, a cloudy sediment was formed, which disappeared entirely when the liquid was shaken, and was not reproduced on adding more acid. I then made use of acetic acid diluted with 100 parts of water. On adding this in drops, a white precipitate was formed, which rendered the diluted serum perfectly opaque, and almost as white as milk. This precipitate increased, until a certain number of drops of the diluted acid had been used. On my desisting from the addition of acetic acid, the precipitate collected in flocks, and sank to the bottom of the vessel, in the form of a thick white sediment. When I continued to add acetic acid beyond the point at which the opacity reached its maximum, it diminished, and entirely disappeared on adding more acid. It was then evident, that a material was contained in the serum, which was precipitated by acetic acid, but was easily redissolved in a very small excess. I have found this precipitate to be produced by dilute acetic acid in every case which I have examined, whether the simple addition of water produced a sediment or not. Independently of various diseases of more or less importance—pneumonia, pleurisy, bronchitis, chronic heart-disease, morbus Brightii, delirium tremens, phthisis, gastric fever, lumbago, pleurodynia, hyperæmia of the brain, etc.—I have found a copious deposit formed in the blood-serum of comparatively healthy persons of all ages, who were plethoric, and accustomed to be bled ; not one negative result occurred in upwards of forty experiments. The white sediment furnished by an ounce of serum, formed a layer two lines in thickness, at the bottom of a cylindrical glass two-and-a-half inches in diameter. Every doubt as to the physiological, as well as the pathological, constancy and importance of the precipitated material, was removed by its being found in the blood-serum of calves, oxen, sheep, and swine. This gave, after dilution with water, a very copious precipitate with highly diluted acetic acid, as well as a perceptible opacity on simple dilution with water.

The precipitate, formed by the addition of dilute acetic acid to diluted serum, could be very easily collected on a filter, while the fluid portion passed

through perfectly clear. The latter had a neutral reaction, when acetic acid was carefully added ; and on being boiled it threw down albumen, in greater quantity than before the addition of acetic acid, and the removal of the material collected on the filter. This first became, on being dried, diaphanous and glutinous, then diminished in volume, and became glittering, hard, and brittle, so that it could be easily reduced to a white powder. Sometimes, instead of being transparent when dried, it assumed a fallow or a green colour. This difference of colour seemed to depend rather on accidental circumstances than on any essential difference ; for I found in some cases, that one portion of the same serum became yellow or brown on drying, while another assumed a green colour. Future observations may further elucidate this point.

With the exception of this occasional variation of colour, the protein compound, precipitated by the addition of water, was acted on by re-agents in the same manner as that produced by acetic acid. Both were easily soluble in an excess of acetic, or of other strong acids, and were precipitated from this solution by ferrocyanide of potassium, but not by ammonia, potash, or soda. Both were easily soluble by the caustic alkalies and their carbonates, as well as by solutions of phosphate of soda, sulphate of magnesia, sal ammoniac, common salt, chlorides of calcium and barium, and other salts. When the solution in phosphate of soda was diluted with water, acetic acid, in either case, again produced a precipitate, soluble in an excess of the acid. Both precipitates were insoluble in ether, cold alcohol, and water. This uniformity of behaviour with re-agents, seems to establish the identity of the precipitate produced by water, with that afterwards obtained by adding very dilute acetic acid. Pure undiluted serum gave, at first, no precipitate when treated with acetic acid ; but I have since found it to be produced, and to be soluble in an excess of the acid.

When the white of an egg is poured into a glass of water, a quantity of matter is separated in the form of filaments and membranes, sometimes in the form of molecules, so as to render the liquid opaque : it might hence be imagined, that this substance is identical with that which is furnished from serum. A careful investigation has convinced me that the two are very different. The filaments and membranes, which appear on pouring the albumen of an egg into water, bear a perfect resemblance, under the microscope, to fibrillated fibrin. They swell out and become transparent on being digested with acetic acid, but are dissolved with great difficulty, even in the concentrated acid,—in these respects resembling fibrin. That portion which is dissolved by acetic acid, is precipitated by ferrocyanide of potassium. No precipitate is formed, or at least slowly and imperfectly, by phosphate of soda and other medicinal salts. The molecular precipitate appears only when the eggs have been kept for some time, and increases with their age, while the quantity of filamentous and membranous matter decreases. It does not disappear on the addition of acetic acid or its salts, and only after a long time when treated with alkalies.

The question now arises, whether we can deduce any more accurate conclusions as to the chemical nature of this substance, beyond what we have already shewn,—that it is a *protein-compound, insoluble in water?* Fibrin has hitherto been the only constituent of the blood, which could be asserted with certainty, to possess the power of passing from a soluble to an insoluble state, whether in or out of the body. It has hence necessarily arisen, that an unlimited amount of physiological and pathological importance has been ascribed to fibrin. The albumen of serum can be brought, when out of the organism, to pass from the soluble to the insoluble state by various methods, such as heat, alcohol, and most acids, provided they act in a sufficiently concentrated form. But the circumstances, under which albumen is coagulated out of the body, can scarcely operate within it. The substance which has been described, is precipitated by simple dilution with water, and by acetic acid so highly diluted, that it may easily be imagined capable of being formed

in the body itself. The manner in which fibrin coagulates in the form of filaments, the circumstances under which it passes from the soluble to the insoluble condition, and finally, the different manner in which it is affected by re-agents, separate it so essentially from the substance which is being treated of, that the latter will have, in future researches, to be described as entirely distinct. I think it necessary to insist on this, on account of the confusion which has arisen from the description of many different things under the term fibrin: and this has become so important, that most have mistaken the primitive signification of the word fibrin, which, on physiological and pathological grounds, there is good reason for retaining, while there is no cause for rejecting it on purely chemical grounds.

This protein-compound is essentially distinguished from the albumen of serum, by being precipitated by water and acetic acid, which cannot coagulate albumen. It can scarcely be the product of a transformation of albumen: for after the substance precipitated by water and acetic acid has been removed, the liquid still contains a large quantity of albumen: indeed, this appears more plentiful on boiling, than before the addition of acetic acid and the removal of the precipitated material. Besides, after this substance has been separated by filtration, water and acetic acid may be added in any proportions, without producing more sediment; but if the material were derived from the action of water and acetic acid on the albumen of the serum, there would be no reason why the transmutation should cease, after a certain quantity of albumen had been changed into this insoluble substance.

There can then be no doubt, *that our protein-compound is distinct from albumen and fibrin, and exists in the serum in a state of solution with the salts and alkalies, but is separated when the saline matter is diluted, and the alkali united with acetic acid.* This can only be asserted of deutoxide of protein, albuminate of soda, or casein.

With regard to the deutoxide of protein, almost the only circumstance with respect to its chemical reaction which seems to have been noticed, is its insolubility in water. It would therefore seem premature to assert of an unknown protein-compound, that it is not deutoxide of protein. But the difficulty will be removed, when we remember that oxygen produced no effect on the solution of serum in water, while carbonic acid caused a copious precipitate. Albuminate of soda is precipitated, as Scherer and Lehmann have shewn, by acetic acid, but is soluble with difficulty in an excess of acid. This establishes at once a marked distinction between it and our protein-compound. It hence appears, that it can be nothing else than Casein, on the chemical properties of which, new light has been thrown by the researches of Scherer (*Annalen der Chemie und Pharmacie*, Bd. xl), and more lately by those of Rothleder (*Ibid.*, Bd. xl, p. 253), carried on in Liebig's laboratory. Their investigations have shewn, that *casein is always insoluble in water;* and that the so-called soluble casein is a combination of casein with potash, soda, or lime, and that hence the coagulation of the soluble casein by acids, is merely the effect of the union of the acid with the potash, soda, or lime, which was in combination with the casein. Direct experiments on casein, procured from milk by treating it with ether and alcohol, have further convinced me that it is perfectly and easily soluble by phosphate of soda. The chlorine salts, on the other hand, dissolved it with difficulty and imperfectly: this was naturally enough explained by the fact, that the casein which was employed had been treated with ether and alcohol, and perfectly dried,—circumstances sufficient to render all protein-compounds much more difficult of solution, than when they are first precipitated.

We may thus, at least provisionally, regard the substance as casein, as its behaviour with acetic acid hitherto seems characteristic of that protein-compound. The diagnosis has depended only on this, in those instances in which casein has been *occasionally* detected in the blood. Gmelin was the first, who thus found a small amount of casein in the blood, in some rare

cases. Marchand next found it in some instances, both males and females. Finally, Hünefeldt seems to have discovered it in cases in which the secretion of milk was arrested ; but he does not state whether the precipitate formed by adding acetic acid was soluble in an excess, so that no certain conclusion can be drawn from his observations.

The reason why the constant presence of casein in the blood has hitherto escaped the notice of observers, appears from the circumstances already mentioned. Only when the amount of casein in the serum is very great, or the quantity of salts, especially phosphate of soda, is very small, can the casein be precipitated from undiluted serum by acetic acid. But when the proportion of saline matters to the casein is not so small, they retain the casein in the solution, even when it is separated by acetic acid from its combination with soda. It is only when the solvent power of the salts is weakened by dilution with water, that acetic acid can precipitate casein in any quantity ; and even then the phenomenon escapes notice, unless very dilute acid be employed, otherwise the precipitated casein is re-dissolved in the excess of acid. When there is more casein in the serum than is combined with an alkali, so that some is held in solution by the salts in the serum, a portion is at once precipitated on the simple addition of water, and appears first as an opacity, and soon as a sediment. When it is not free, but united with an alkali, simple dilution with water produces no precipitate, until dilute acetic acid is added, which, uniting with the soda, precipitates the casein as a substance insoluble in water.

The great importance which a material with these properties may possess, and very probably actually has, with regard to the healthy or diseased organism, render necessary a far more careful and extended series of researches on its chemical relations. Thus it will be of the first importance to discover a convenient method for performing its quantitative analysis, which has hitherto only been accomplished by an extreme dilution of the serum and by the very careful addition of a highly diluted acid.[1] It will also be important to determine whether carbonic acid alone can separate casein from its combination with soda. But the interest of the subject appears to me so great, that I have been led to publish my observations, imperfect as they are. It is, however, a point of the greatest interest with regard to physiology and pathology, that this material, which occurs in the blood constantly and in notable quantity, can be acted on by re-agents, which are constantly in operation within the organism ; and that, after having been precipitated by them, it can be re-dissolved by many different salts.

A number of important questions here arise : but I can only refer to a few of them.

The relation which this substance may bear to the processes of nutrition and cell-development, in health and disease, can scarcely yet be accurately determined. There are, however, some points which tend to show that this relation must be very important. The following are some of them : (1.) The method in which cell-development is generally performed, commencing, as is well known, by the formation of molecules in the clear mother-liquor : (2.) The facility with which the casein is precipitated from the clear serum in the form of molecules, by re-agents which are constantly in action within the organism—a peculiarity which is possessed by no other of the known constituents of the blood : (3.) The agreement in chemical properties between casein and the cell-membranes of the blood-corpuscles, and of the globules of milk and pus ; which agreement is so great, that several chemists have described these cell-membranes as a modification of casein.[1] Finally, (4.) The

[1] By this process I analysed the blood of a puerperal woman, who had a quantity of milk in her breasts, but did not suckle her child. Two days after delivery, 1000 parts of serum gave 9·9 *parts of dry Casein*, and 53·7 of dry albumen.

remarkable faculty which casein posesses of inducing transmutation in organic substances may lead to a well-grounded suspicion, that it acts in the same way within the limits of the organism.

In the next place, it will be very interesting to point out the relative quantity of casein in the blood during lactation ; and it will likewise be very important to point out the proportion which it bears to the other constituents of the blood, and to the ingesta.

In a pathological point of view, it will be highly important to observe what relation the amorphous molecular mass, which is found in notable quantity in nearly all pathological exudations and deposits, bears to this substance, which may be very well imagined to play a principal part in a great number of organic diseases. Perhaps also, the solvent and antiphlogistic action of saline medicines in many of these diseases will find an easy explanation, in their faculty of dissolving the deposits of this morbid material. In the meantime, it is not to *hypotheses*, but to new *researches*, that we are to look for a solution of the many important questions connected with this subject.

The presence of a material, precipitated from serum by water and acetic acid under various circumstances, seems to have been recognized by Liebig, Zimmermann, Henle, and Vogel ; but none of them appear to have an idea of its real nature.

ANOMALIES IN THE MUSCLES OF THE ARM.

The following case is recorded by Dr. Lente, Resident Surgeon to the New York Hospital :—

P. C., a native of Ireland, admitted into the New York Hospital with diarrhœa, presented the following curious anatomical anomalies. In both upper extremities, the brachial and radial arteries are superficial, being only covered by the integument, and looking much like distended superficial veins. The bifurcation of the brachial into the radial and ulnar, is at the usual situation. The ulnar dips under the superficial flexors and pronators of the fore-arm, as usual ; while the radial, following its ordinary direction, is superficial, being, like the brachial, only covered by the common integument. In the left upper extremity, there appears to be a total absence of the biceps flexor cubiti muscle ; there being only the brachialis anticus, which occupies its usual situation, between the integument and bone, and is not unusually developed. Flexion of the fore-arm upon the arm is performed mainly by the supinator longus and extensor carpi radialis muscles. When the man attempts to flex the fore-arm, with a heavy weight in the hand, the former muscle appears like a tense cord stretched from the commencement of its origin in the arm, to the middle of the fore-arm, there being no angle at the elbow in front. The tendon of the left brachialis anticus appears to be inserted lower down on the ulna than usual, and, of course, to assist more in flexion of the fore-arm. In the right arm the biceps exists of the usual size. In both extremities, when the fore-arm is extended upon the arm, they form a continuous line with each other; there being no external lateral angle at the elbow-joint, as there should be in a well-conformed extremity. No arterial or muscular anomalies are discoverable in the lower extremities.

Anomalies in the muscular system are comparatively uncommon, and, when met with, are usually "confined to their symmetrical absence." The above case presents an exception to this rule. A case is related, as one of great rarity, by Mr. Lucas, lecturer on anatomy in London, in which one palmaris longus was absent, and one present ; one pyramidalis (which is not very uncommon), and one psoas parvus. [*New York Journal of Medicine*, May 1850.]

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[1] Simon refers the globulin, forming the envelopes of the blood corpuscles, to Casein, and plainly calls it "Blood-casein." It is, however, essentially different from that which we are describing as existing in the serum : and it would therefore be preferable to restrict to it the term globulin.

PRACTICE OF MEDICINE AND PATHOLOGY.

IDIOPATHIC ENLARGEMENT OF THE SPLEEN; UNUSUAL NUMBER OF WHITE CORPUSCLES IN THE BLOOD.

The *Medical Times* for June 15, 1850, contains a CLINICAL LECTURE by Dr. PARKES, on a case which presented an interesting pathological state of the Blood; viz., the occurrence of an unusual number of White Corpuscles, in connexion with Enlargement of the Spleen. We reprint Dr. Parkes' lecture with very slight abridgment; agreeing with him, that "it is by the observation of such cases as these, in which the ordinary operations of the body seem to be reversed or suspended, that pathology tends to throw such light on the healthy processes, the nature of which is often best detected by the study of the deviations from them."

CASE: J. S., aged 69, admitted December 13, 1849; an Irishwoman, but has lived in London sixteen years. A fruitseller in the streets; much exposed to cold and wet; had never drunk spirits nor smoked; had always lived well; had taken meat every day, except on Fridays, and a little beer. Appeared never to have had any serious illness; never had ague, or anything which seems to imply any kind of malarious disease. Towards the end of 1848 was in St. Bartholomew's Hospital for swelled feet and legs, but was discharged well in a fortnight. Shortly after her discharge, she began to feel severe pain low down in the left side, and one day, on examining the side, she found a considerable swelling below the false ribs on that side. She had no shivering, sickness, or fever. She then, January 1849, entered University College Hospital, under Dr. Williams. At this time she was thin, weak, with a yellow skin, but clear conjunctivæ; and with a large and tender swelling, extending from the margin of the left false ribs to the crest of the ilium. For this she was treated with blisters, iodide of potassium, and morphia to relieve the pain, which appears to have been severe. The urine at this time was non-albuminous; at first alkaline and with phosphates, afterwards acid, and with deposits of uric acid and lithates. She had, on several occasions, morning sickness, and vomited a little blood. She left the hospital at the end of February, feeling stronger and easier, but with the tumour undiminished in size. She continued at her occupation till November, when she was knocked down by a cart, the wheel of which, according to her account, passed over the pelvis. She suffered severe pain in the abdomen from this accident, and was unable to leave her bed for four weeks. When she was able to walk, she became an out-patient of Dr. Jenner's, who, on discovering the nature of her complaint, sent her into the hospital. On admission, on the 13th December, 1849, she was thin and shrivelled, without œdema or enlargement of veins; there was a peculiar dusky, yellowish-brown colour of the skin, most evident on the trunk, and less marked on the face and extremities; the conjunctivæ were clear; there were no head symptoms; and no pulmonary symptoms, with the exception of a little dry friction low down on the left side; there was a feebly acting heart, in its right position, and without bruit; the pulse was 72, regular. A large tumour, evidently an enlarged spleen, filled the left side of the abdomen, descending from the lower border of the seventh rib, nearly to the ilium, bulging into the posterior left lumbar region when she lay on her back, and reaching nearly to the umbilicus on the right; falling over considerably to the right of the umbilicus when she lay on the right side; with a prominent, ridged, smooth lower border; very hard throughout, and tender; the extreme length of the dull percussion note was 8 inches; no splenic murmur was ever audible. The height of the hepatic dulness (vertical line from nipple) was $4\frac{3}{8}$ inches; the lower edge was $1\frac{1}{4}$ inch below the

false ribs ; to the left of the middle line, the hepatic dulness confounded itself with the splenic, that is to say, with the dulness of the tumour. There was no fluid in the peritonæum, no nausea ; the appetite was good, the tongue clean ; there were no intestinal or uterine symptoms. She had had no hæmorrhage, except a little hæmatesis, apparently, when she was in the hospital previously. During the patient's stay in hospital, she remained nearly in the same condition. Occasionally she suffered from severe frontal headaches ; she also had, on several occasions, sharp stabbing pains in the abdomen, over the spleen and liver, for which leeches were applied, the bleeding from which was profuse and not very easily arrested. On four or five occasions, also, she had moderate shivering, followed by heat and sweating ; these attacks were not very regular, seemed to observe no certain times, and were separated from each other by long intervals. On the 27th February, according to her own account, she passed a pint of blood with a stool ; but this, and another stool passed subsequently, were thrown away accidentally ; the next stools were free from blood. With this exception, she had no bleeding from any part of the body, and none into the substance of the skin. On the 17th of March, the patient left the hospital, nearly in the same state as on admission.

Examination of the blood. The blood was examined microscopically many times, a drop of blood being taken from the end of the finger for this purpose ; the appearances noted were always the same. When the drop was put under the microscope, the red particles, as in health, ran together in the usual time and formed rouleaux, and presented no appreciable deviation from the healthy standard. But interspersed among the meshes formed by the rouleaux, were an immense number of pale corpuscles. On many occasions, when examined with a power of 350 diameters, there were at least from 240 to 300 of these corpuscles in the field at once : at least 60 were counted in a quarter of the field on one occasion, and 60 in a sixth of the field on another ; and these were not all. At other times they were rather fewer in number, perhaps from 100 to 120 in the field. They were very variable in dimensions, ranging from a size three or four times as large as, to a size hardly larger than, a red particle. The majority, however, were large. They differed considerably in transparency, some being very opaque, comparatively dark-coloured, and slightly granular on the surface ; others were more transparent and smoother. As a general rule, the larger ones were darker and more granular-looking ; the smaller more transparent. They were round or slightly oval ; some few were indented on the side. Nuclei could not be seen in the larger darker cells without re-agents ; but in some, there appeared to be an aggregation or collection of the granular contents at one particular point, which was generally at the side. In the transparent cells, nuclei were very indistinctly seen. Acetic acid dissolved the opaque contents, made the cell-wall transparent, and in every case brought out nuclei. The nuclei, which were small for the most part, were very well defined, with dark borders, slightly oval, were seated generally eccentrically, but sometimes towards the centre, and varied in number from one, or more usually two, to four or five. Often there was a single nucleus of a horse-shoe or reniform shape, deeply indented, as if it were about to cleave into four or five smaller nuclei ; in other cases, there was a crescent-shaped nucleus, with no apparent indentations or divisions. In many cases, if a reniform or crescent-shaped nucleus, with the deep indentations, had separated into smaller parts, each separate part would have accurately corresponded in size and appearance with the smaller separate nuclei, which were seen in other cells. In some cases, the small oval nuclei were crowded together eccentrically, so as to make the cell look very much like some pus cells. In addition to these cells, Dr. Jenner noticed some cells with large central nucleolated nuclei, which did not bear nearly so much resemblance

to ordinary white corpuscles, as the more numerous cells which I have just described to you. I also noticed, on one occasion, some very small, not very well defined white corpuscles, smaller than red particles.

These white corpuscles could be obtained in various ways; they were seen quite readily by placing at once a drop of blood under the microscope; also by heating the blood and separating the fibrine: the heavy red particles subsided to the bottom of the vessel, while above them, and below a layer of perfectly clear serum, floated a thick white layer, composed entirely of white corpuscles. Finally, by allowing the blood to coagulate in a small evaporating basin, the surface of the clot became quite white in the course of a few minutes; and on examination, this was found to depend on the entanglement of a vast number of pale corpuscles in a most delicate web of fibrine. When the blood was drawn into a long narrow vessel, or allowed to coagulate in a flat-bleeding basin, it did not, however, exhibit this phenomenon, or show any disposition to buff or cup. These corpuscles were carefully compared with the pale corpuscles, seen in healthy blood; and with the exception of their much greater numbers and larger size, I could discern no difference.

The other of the physical characters of the blood were as follows: When drawn from a vein, the blood coagulated as rapidly as usual; it formed a clot which was firm, but rather voluminous; in some forms of vessels, the pale corpuscles appeared at the surface of the clot a few minutes after coagulation. In other cases they did not. The serum was separated in good quantity, had a light greenish tint, and was perfectly transparent.

The venous blood was analysed on two occasions. First, on the 20th Dec., the blood being taken three hours after food. The fibrine having been separated by beating, was washed, boiled in alcohol, and then dried and weighed; the red particles were estimated by subtracting the weight of the fibrine and the solids of the serum in 1000 of blood from the weight of the whole solids in 1000 of blood; the coagulable matters of serum (albumen) were obtained by coagulating the serum, washing with boiling alcohol and water, drying and weighing; the salts of the serum, by evaporating the washings, and burning off the organic matter; and the incoagulable organic matters of serum were estimated, by deducting the weight of the albumen and salts from the weight of the whole solids of the serum. I shall point out to you directly, that this method, which, like all other methods, is defective, was especially so in the present analysis.

The composition of the blood in 1000 parts was then as follows:—

Fibrine (with probably adherent white corpuscles)	7·08
Red particles, with a number of white corpuscles which could not be separated	101·63
Coagulable organic matters of serum	63·03
Incoagulable	3·08
Soluble salts of the serum	8·63
Insoluble salts of the serum	·48
Water	816·07
	1000·00

The composition of the serum was as follows. The reaction was strongly alkaline:—

Coagulable organic matters	70·71
Incoagulable	3·46
Soluble salts	9·68
Insoluble (obtained by incinerating the dried albumen) ...	·55
Water	915·6
	1000·0

A small portion of serum was examined for uric acid in the ingenious

method devised by Dr. Garrod, viz., by the addition of a little acetic acid to a portion of serum in a watch-glass, at the bottom of which lies a fine hair. No crystals of uric acid could, however, be perceived.

On the 15th of February, the patient was bled again three hours after food; the fibrine was estimated by washing the clot. The composition was as follows:

Fibrine (with probably adherent white corpuscles)	4·75
Red particles (with undetermined white corpuscles) ...	97·73
Organic solids of serum	69·27
Inorganic solids of serum	8·25
Water	819·8
	1000·00

In the first analysis, the solids are in rather higher proportion (183·93 to 180·2), the fibrine rather in excess (7·08 to 4·75), the red particles in somewhat greater abundance (101·63 to 97·73), the salts are nearly the same, or in slight excess (9·11 to 8·25). But the agreement between the analyses is very considerable. The special fallacies of the analyses were these; although I did not microscopically examine the fibrine, it yet seemed likely that its apparent great abundance might have been in part owing to adherent white particles; also many of these particles were evidently mixed up with the red particles, as was proved by the thick white layer above the heavier red particles in the defibrinated blood, and I could devise no means of separating them. I could, indeed, have drawn off the white particles with a pipette from the red layer below, but then I could not free them from the serum, and therefore could not in any way estimate them. The proportions, therefore, of fibrine and of red particles, as given in the analyses, are unduly high, although it is difficult to say to what extent this is so. These inferences may, however, be safely drawn; viz., 1, that the blood was poor in solids; 2, that it was not deficient in fibrine; 3, that it was poor in red particles; 4, that it was very rich in white particles; 5, that the albumen was at nearly the natural standard, and the incoagulable matter of serum rather small in amount; 6, that the serum was rather more plentifully supplied than usual with soluble salts.

Examination of the Urine. The condition of the urine was carefully noted every day, and the following was the usual state:—It was generally copious; sixty, eighty, and even a hundred ounces being often measured in the twenty-four hours; and, in addition, there was generally some passed in the closet. It was generally acid, rarely neutral, of pale amber colour, with deposits of pale lithates, and incidentally of phosphates, and now and then of oxalate of lime; it contained albumen, in very variable quantity, a small quantity of oil-globules on two occasions, and once gave an indication of bile.

I had only time to make one chemical examination of it. From the 25th to the 26th of December, the urine of twenty-four hours was most carefully collected; it measured 90 oz. It was nearly colourless, with a neutral reaction, and a deposit of pale lithates perfectly soluble by heat. The specific gravity (by bottle) was 1026·1 (temp. about 45° Fahr). It gave no tint with nitric acid, but threw down albumen by heat and nitric acid. The urea was estimated as nitrate (48·93 per cent.) after the albumen was separated; the other ingredients in the usual way. The composition in 1000 parts was as follows:—

Urea	10·57
Uric acid	·75
Albumen	2·
Extractives	12·18
Soluble salts, of which about 4·56 was phosphate of soda ...	10·07
Phosphate of lime and magnesia	·59
Water	963·84
	1000·00

We also endeavoured to determine the diurnal changes of the urine; but the examinations did not disclose any very striking points. It is interesting, in connexion with the lowered amount of red blood particles, to observe, that the urine was, throughout, deficient in colouring matter, as indicated by the continual appearance of *white* lithates; it was also too copious; the albumen varied in amount on different days and at different periods of the same day very considerably; it was never associated with casts of tubes or renal epithelium, and did not appear to imply true Bright's disease. No remarkable features were observed in the perspiration, stools, or saliva.

Remarks. The condition of the spleen, in cases similar to the one under consideration, has not been very accurately determined. After death, the organ is found large, very hard, dark-coloured on the surface, with a mottled section, which seems frequently to be caused by fibrinous exudation, thrown out into the interstices of the organ. Sometimes, as noticed by Virchow, there are large fibrinous masses.

There are various interesting points arising from the consideration of this case, to which I must now shortly allude.

1. That the simultaneous occurrence of an extraordinary number of colourless cells in the blood, and of a great enlargement of the spleen (not consequent on ague, and probably special in its nature), is something more than a mere coincidence, appears certain, from the number of times that it has been observed. Virchow has assembled the majority of cases hitherto recorded, and has added some himself; altogether, he has collected eleven. We may add to these, four other cases,[1] which are not included in this list, and, with the present case, the number is raised to sixteen. Now, although the white corpuscles of the blood are liable to very great variation in number, and, although their changes are very imperfectly known, it yet would seem but fair to infer, that when two rather uncommon phenomena, (viz., the immense number of cells in the blood, and idiopathic enlargement of the spleen), occur together in sixteen cases, and either phenomenon separately, has been only once noted, that there is some intimate connexion between them. Yet mere congestion and hypertrophy of the spleen will not cause increase of white corpuscles, as is proved by a case recorded by Vogel (*Canst. und Eisenm. Jahresb.* 1849, p. 11).[2]

2. It is probable, also, that of these two phenomena, the enlargement of the spleen is the anterior, and stands more or less closely in the relation of cause to the other condition. At least, there is one argument for this view. Admitting that there is some causal relation, it might be supposed, *à priori*, that the spleen, by its change, might give rise to the development of the pale corpuscles, or that the pale corpuscles, formed in some unknown way, might occasion the enlargement of the spleen. But an interesting observation, made by Virchow, seems conclusive against this last supposition; for he has noticed (*Archiv.* 1849, p. 567), that in a case in which there was an extraordinary hypertrophy of the lymphatic glands, both internal and on the extremities and neck, the white corpuscles were in such numbers as to make

[1] The references to the literature on this subject are *Froriep's N. Notizen*, 1845, p. 780: *Med. Vereinzeitung*, 1846, Nos. 34, 36; 1847, Nos. 3, 4; *Canstatt und Eisenm. Jahresbericht*, 1846, p. 23; *Virchow's und Reinhardt's Archiv.*, 1848, p. 563; Ibid., 1849, p. 587; *Transactions of the London Pathological Society* (cases by Dr. T. K. Chambers), p. 109; Dr. Fuller's case (*Med. Gaz.* 1846, p. 404), is included in Virchow's list. In the *Monthly Journal of Medical Science* (May 1850), Dr. Bennett alludes to a case under his care. A case occurred in University College Hospital in 1846, under Dr. Taylor, and was carefully recorded, but has not been published.

[1] Since this Lecture was delivered, Dr. Fuller exhibited to the Pathological Society of London a specimen of encephaloid disease of the abdomen, taken from a patient in whose blood there were numerous white corpuscles. The inference in the text appears, however, still to hold good.

the blood, found in the right auricle after death, look quite purulent in appearance; they were in as high proportion to the red corpuscles as 2 to 3. In this case, the spleen was not at all enlarged. Therefore it appears fair to infer, that if, in this case, the white corpuscles, in such numbers, could not cause any enlargement of the spleen, the cases, in which the spleen was enlarged, were not dependent on the condition of the blood. It would seem, therefore, that, admitting a connexion between the two phenomena, the enlargement of the spleen in one set of cases, and of the lymphatic glands in Virchow's case, will be proved hereafter to be anterior to the change in the blood.

3. As to the nature of these white corpuscles, the first question is, as to their relation to the ordinary pale corpuscles. I have already stated, that, as far as I could see, there were no differences, beyond those of numbers and larger size, between these cells and the ordinary corpuscles of the blood. Indeed, on examining some specimens of healthy blood, there appeared to be greater differences as to size and transparency between any two cases, than between either specimen and the corpuscles of the diseased blood. The next question which suggests itself is, the degree of resemblance between these cells and pus-cells. Virchow and Vogel have already expressed an opinion, that the white corpuscles in healthy blood, and in this splenic disease, cannot be distinguished from pus mixed with the blood. And certainly, if we take the characters which have been held to distinguish pus-cells from white corpuscles, we find them to fail altogether when we apply them to the case before us. For example, Lebert and Sédillot[1] have laid down the following distinctive marks between pus-cells and white corpuscles:[2] that the pus-cells are larger, of a more yellow colour, perfectly spherical, have a rougher and more granulated surface, and have much larger and better defined nuclei. But, however true these distinctions may be between well-marked pus-cells, and some of the white corpuscles of healthy blood, they will not apply to many of the cells in our diseased blood; for we had cells of extraordinary size, very granular on the surface, and darkish in colour, though not yellow, with nuclei after the addition of strong acetic acid, better defined and larger in appearance than the nuclei of the pus-cells. So, also, it could not be perceived, that these cells were flattened; they appeared as spherical in shape as pus-cells are. And as to drawing any distinction between the grouping of the nuclei in these cells and in pus-cells, it can hardly be ventured upon, in the face of the observations of H. Müller and Henle, who have indicated the remarkable differences which can be artificially produced in the nuclei of pus-cells and lymph corpuscles by the addition of acetic acid of various degrees of strength.[3] But although there were some corpuscles in this blood which could not, I think, be distinguished from pus-cells by physical characters, yet, if all the pale corpuscles could have been separated from the red particles, and shown to any one, I do not think that they would have been mistaken for pus. There seemed to be perceptible differences in the very variable size, in the smoothness and comparative transparency of many of them, and in the white colour of the smaller ones, between them and pus. And of course, although the distinctions cannot be well drawn, it would be as wrong to call these cells pus-cells, as to give that title to the ordinary white corpuscles of the blood.

No transition from these pale corpuscles into red corpuscles could, as far as I could see, be made out. The white corpuscles varied infinitely in size,

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[1] De l'Infection Purulente ou Pyoémia. Par le Docteur C. Sédillot. Paris: 1849. Page 267.

[2] Ibid., p. 404-5.

[3] I am aware that Reinhardt and others have disputed the supposed splitting of the nucleus under re-agents, but the positive observations of Henle seem unanswerable.

yet there was no difficulty in referring every white or red particle to its proper class. We did not see, either, how these white particles retrograded, whether by fat metamorphosis, or some kind of pigment transformation—changes which have been observed by Virchow and others.

4. The exact nature of this disease is still obscure. The only conclusion we are entitled to draw from the facts before us, is, that there is some intimate connexion between these affections of the spleen and of the blood ; but, when it is remembered how little known are the changes which the healthy spleen produces upon healthy blood, how completely unexamined at present are the changes which spleens, diseased in various ways, produce on the blood, and how little examined the white corpuscles of the blood have been, it must be confessed that we are not entitled to go farther than this. The very fact, that every enlargement and congestion of the spleen is not attended with excess of pale corpuscles in the blood, should make us hesitate at present to do more than record the facts as a basis for some future inquiry. Virchow has spoken of the disease as a kind of interruption, or arrest of the development of the red blood cells ; and our case so far supports this, as proving that the red particles are notably diminished in amount. But this opinion of Virchow is, of course, simply a conjecture.

5. In comparing the phenomena of this case with those of the cases already reported, we find a considerable resemblance. A tendency to inflammations and hæmorrhages seems generally to exist, and our patient had frequently pains over the spleen and liver, which appeared inflammatory ; she had also hæmorrhages from the digestive mucous membrane (certainly from the stomach, and, according to her own account, from the intestines), and the profuse bleeding from the leech-bites pointed also to an hæmorrhagic tendency. There did not appear to be any disorder or perturbation in the system from this condition of blood. Digestion in the stomach was performed without apparent difficulty ; and, although there was emaciation, it was not greater than might be accounted for by the age of the patient. As far as the urine was concerned, the proper quantity, or even an excess of uric acid, urea, and indeterminate organic matters, appeared to pass out of the system. Although there was a dusky yellowness of the skin, there was no true jaundice. The pulmonary functions did not appear altered.

6. The causes of this peculiar disease are quite unknown. In almost all the cases, the splenic enlargement has ensued without obvious cause. In one of Virchow's cases, the patient had had ague fifteen years previously ; beyond this there appears no reason to suspect a malarious cause for the enlargement. Our patient was certain she had never had ague, and she had resided for sixteen years in London, where ague is very uncommon. While in the hospital she had some irregular shivering fits, followed, as such fits usually are, by heat and sweating ; but there was no attack of true ague.

7. The treatment adopted in this case was not much varied. I was desirous of trying, in the first instance, the effect of the disulphate of quinine ; at first, half a drachm, and subsequently, 45 grains were given every twenty-four hours for forty-two successive days, without any apparent change in the size of the tumour, or in the amount of colourless corpuscles. All this time, also, iodine ointment was rubbed over the spleen. She took, also, six grains of iodide of potassium with nine grains of disulphate of quinine, for twenty days, without effect. Finally, seven days before she left the hospital, we began to give iodide of potassium, with the intention of pushing the dose. She took ʒss in the twenty-four hours during these few days, without effect, and continued, also, the iodine externally. Occasionally, the spleen either varied in size, or the intestines encroached upon it, and caused an apparent difference ; but, on subsequent examinations, the abdominal tumour used to be found as large as ever, and the blood examined about four days before the patient went out, contained as many pale corpuscles as usual. I intended to have tried various other remedies, iron, mercury, etc., had the patient not quitted the hospital.

8. After death, it would appear, that the separation between the red and white corpuscles gives a whitish or yellowish-white colour to the blood in the heart and large vessels. Hence Virchow has termed the disease "*Leukæmia*", *white blood*, a term which has also been used to designate that condition of the blood in which, from various causes, the serum is milky. The propriety of calling this splenic disease "Leukæmia", may be questioned. The blood in our case was not in the least white; the serum was perfectly transparent; and, although occasionally the white particles would collect on the top of the recent coagulum, and give a pseudo-buffed appearance to the clot, this did not occur on all occasions, and usually the pale corpuscles were uniformly intermixed with the red in the clot, and there was not the least trace of *whiteness* about any portion of the blood. The phrase "white blood" having been appropriated to milky-looking serum, it is, perhaps, desirable to leave the disease, which we have now considered, for the present unnamed.

DIGITI SEMI-MORTUI: THEIR CONNEXION WITH CHLOROSIS, AND WITH DISEASE OF THE BRAIN AND SPINAL CHORD.

M. Gillet de Grandmont has addressed a letter to the editor of the *Gazette Médicale* for May 25th, 1850, of which the following is a translation:—

The *Digitus Semi-mortuus*, mentioned by Dr. Marshall Hall,[1] is never otherwise than the symptom, or one of the symptoms, of another disease, which is met with in young people, in adults, or in old persons.

Connexion with Chlorosis. It is most commonly one of the symptoms of Chlorosis in young girls; I have also observed it in pregnant women who had an anæmic appearance. In young females, sometimes one finger, but most generally several together, are affected. The temperature is decreased, as is easily ascertained by the hand or by the thermometer. The fingers are insensible to pretty strong pressure; a prick with a pin gives no pain, and does not draw blood, or gives a very slight rosy tint. The power of motion remains, but it is embarrassed, and appears to the patient as if mechanical. The appearance of the skin is that of wax; life seems to have deserted the organ. This condition is of varying duration; it is principally observed at rising from bed, and in the course of the morning; it more rarely appears during the day. Dry or alcoholic stimulating frictions, immersion in slightly tepid water, exercising the hand, as with a shuttlecock or skipping-rope, cause it to disappear; but in proportion as the other symptoms of Chlorosis disappear under the influence of proper treatment, this singular symptom occurs less and less frequently, and at last disappears. Some of the chlorotic patients, who are subject to this singular affection, have their teeth of a dirty white colour, which indicates a predisposition to spasmodic convulsive affections. The patients who are affected with *Digiti Semi-mortui*, complain more particularly, among the other symptoms of Chlorosis, of pain in the head, of involuntary stretching of the limbs, and sometimes of violent tremors of an hysterical nature. For several years I have very often met with this affection in chlorotic patients. My attention was first directed to it by a young lady of my family, who pointed out to me that "her fingers were dead". She used to strike them, rub them with a brush, or plunge them in very hot water; and it was only after a certain time that the affection disappeared,—after continuing for half an hour, or even for more than an hour. This symptom is not constant; it appears at more or less distant intervals, according to the general state of the constitution; but it almost always accompanies, precedes, or follows, the nervous convulsive condition. Several young females have predicted an aggravation of their malady, on observing the phenomenon become more frequent or intense. As I have already said, the same treatment which removes the cause of Chlorosis, causes this affection to disappear.

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[1] London Journal of Medicine, April 1849, vol. i, p. 327.

But when, as is often the case, patients, who are nearly cured, neglect to continue the use of iron, the dead fingers are among the premonitory symptoms of a return of the Chlorosis.

Connexion with Disease of the Nervous Centres. The *Digitus Semi-mortuus*, which is met with in adults and in old persons, differs in its characters from that which I have just described. In the latter case, the symptom is preceded by very slight formication, and the cooling is more gradual, but much more persistent; it is sometimes accompanied by a slight flexion of the finger on the palm of the hand, or of the phalanges on each other. In these cases, the finger does not seem so deprived of life as in the other; but the condition continues longer, and when sensibility returns, it seems like the result of a slight internal electrisation, or succession of small electric shocks, as is observed in neuralgic affections. At other times, the finger trembles, and becomes slightly painful at the extremity. There is seldom more than one finger affected at first,—principally the middle finger. The finger often remains straight, and cannot be easily bent by an effort of the will; it also seems affected with a sense of itching, or slight internal retraction. This affection is the precursor of a malady which proceeds slowly but continuously,—an affection of the cerebral and spinal nervous centres. Too much attention cannot be paid to these slight premonitory symptoms; patients often do not observe that terrible diseases are often ushered in by them. I knew a man, once celebrated, who now drags out a painful existence, from not listening to the advice of his physician to cease from work. He considered his own malady as a slight nervous affection; and yet the *Digitus Semi-mortuus* was the first symptom of a severe disease of the cerebellum and medulla oblongata.

HAY FEVER: ITS CAUSE, AND ITS CURE BY NUX VOMICA.

Hay Fever or Hay Asthma is (in England) a well known complaint, by which many—especially females, and those of irritable surface—are annually distressed during the droughts of summer. Daily, or more frequent, paroxysms of difficult respiration, severe prolonged sneezing, and a burning pain in the nostrils, eyes, and face, are the usual symptoms. Dr. Craigie and others doubt the common explanation of the cause of the affection, viz.: that it depends upon irritation of the peripheral extremities of the imperfectly protected nerves of the nostrils, etc., by the subtile pollen of the innumerable flowers, especially the grasses, which bloom in May and June, and with which the atmosphere must, in some localities, be greatly charged. In the vicinity of hay fields and wild pasturage, if the weather be dry, those who are susceptible are certain to suffer; whereas, a rainy season, or sojourn on the sea-coast, will enable such persons to escape. Observation of many such facts has fully satisfied us, that there is no good ground for the incredulity expressed in the following passage by Dr. Craigie. "A particular variety," says he, "of catarrh, most prevalent in the summer months during the inflorescence of the hay crop, in certain situations, has been believed to be connected with some irritative vapour exhaled from the flowers of some of the grasses, and has therefore been distinguished by the name of Hay Fever. It is doubtful whether this idea of the origin of the disorder be well founded; and it seems quite as likely that it is produced, as other varieties of catarrh, by imprudent exposure during excessive heat. The liberties which are often taken during extreme hot weather, are sufficient to induce catarrhal disorders, without having recourse to the assumption of a peculiar emanation." (*Practice of Physic*, vol. i, p. 824: Edin. 1837). We will venture to say, that no one who had seen such cases of Hay Fever as abound at this season, and as we have had to deal with during the present and former seasons, and who has carefully investigated into their personal and topographical peculiarities, could have written the paragraph just quoted. The popular theory is correct, that Hay Fever

bears no relation whatever to common catarrh from exposure to cold. We feel assured that the cause and the cure in the two complaints are totally different.

We have been led to make these remarks, from having just perused a short note by Mr. G. T. Gream, in the *Lancet* of June 8th, 1850, p. 692, in which he recommends Nux Vomica as a cure for this troublesome complaint. He correctly remarks, that the efficacy of this method is not generally known. The following is the essential part of Mr. Gream's paper: "I am indebted to my friend Mr. Hammerton, of St. George's Hospital, for suggesting to me the Nux Vomica as a remedy in this complaint, which has frequently caused me, personally, much annoyance. It was administered by a friend of his to large numbers of the country people in his neighbourhood, who flocked to him annually for relief, having experienced so much benefit from it. Having taken it for three years with decided effect, and having for nearly that time prescribed it for others, with equal success, I feel bound to publish it through your columns, if you will do me the favour to insert this letter, the results of its use in a harassing disorder, with which many persons are at this time threatened. The preparation recommended, and which I have always prescribed, is the tincture of nux vomica of the "Dublin Pharmacopœia." Ten drops of this should be given for a dose, in water, and increased gradually to twenty drops, three times a day: the action of it should at first be watched. It is an agreeable light bitter; increases the appetite; and influences the Schneiderian membrane, no doubt through the medium of the nerves. I have accompanied the administration of the tincture with the application of an ointment (as high up in the nostrils as possible) composed of one drachm and a half of Goulard's extract, two ounces of spermaceti cerate, and a few drops of oil of roses or of bergamot."

OBSTETRICS.

SKODA ON THE CAUSES OF PUERPERAL FEVER—EXPERIMENTS ON ANIMALS.

In a paper read before the Medical and Chirurgical Society of London, on November 28th, 1848, and published in Volume xxxii. of the Transactions of that Society, Dr. Routh brought before the notice of the British Medical public, the discovery by Dr. Semmelweis, of Vienna, of the cause of the great frequency of Puerperal Fever in the Lying-in Institution of that city: viz., the introduction of poisonous animal matter into the uterus by the hands of the accoucheurs; and he also referred to the success which had attended the preventive means recommended by Dr. Semmelweis, of washing the hands with chlorinated water after making post-mortem examinations.[1] Dr. Skoda, of Vienna, has also examined the subject, and has laid before the Academy of Sciences of that place the result of his investigations, which have been published in the *Zeitschrift der K. K. Gesellschaft der Aerzte zu Wien*, for February 1850. The first part of his communication refers to the circumstances which led to the discovery made by Dr. Semmelweis: and his remarks are confirmatory of what has already been laid before the profession in this country by Dr. Routh.

The second division, of which we shall give a translation, refers to the measures necessary for ascertaining the correctness of the results at which Dr. Semmelweis has arrived. On this subject, Dr. Skoda writes as follows:

When the washing of the hands in chlorinated water had been for some time in use, with apparently highly successful results, Dr. Semmelweis communicated his idea to Professor Rokitansky, myself, and other physicians of the Hospital. We did not doubt for a moment that his view

[1] For an abstract of Dr. Routh's paper, see the London Journal of Medicine for January 1849, p. 108.

would prove correct: and I lost no time in making the discovery known to the Director of Medical Studies, in the expectation that a committee would be appointed to inquire into such an important fact. But my representation appears to have been merely made known. A more probable opportunity of bringing the matter publicly into notice, was the great number of deaths in the Lying-in Hospital at Prague, which were probably due to the same cause as those at Vienna. I therefore recommended the use of chlorinated water in Prague; but as it seemed to be the general opinion in that place, that Puerperal Fever was propagated by epidemic influences, the means recommended by me seem to have had little or no trial.

Dr. Semmelweis applied to the obstetric professors in foreign countries, to test the correctness of his observations: but the only precise answer received was from Kiel. Dr. Michaëlis, the superintendent of the Lying-in Institution of that place, reported on the 18th March, 1848, that the hospital had been closed from the 1st July to November, 1847, on account of the great mortality which prevailed. At the latter period, it was again opened, and the disease broke out as severely as before. In December, 1847, Dr. Michaëlis heard of the discovery of Dr. Semmelweis, and forthwith instituted the use of chlorinated water. Subsequently to that period, there was only one case of Puerperal Fever; and that one is attributed by Dr. Michaëlis to the use of a catheter which had not been properly cleaned. On the other hand, Professor Kiwisch, of Würzburg, stated that he had frequently attended pregnant and puerperal women, immediately after making *post-mortem* examinations, without observing any untoward results.

At my suggestion, a commission of the Professors of the College was appointed to examine into the following questions:

(*a*) From the construction of tables, in which were given the name of each assistant or student attending on the cases, to determine whether the number of cases of Puerperal Fever bore any relation to the employment of the assistants and students in the dead-house. (*b*) To examine into the so-called street-births (*Gassengeburten*). When a female enters the hospital soon after being delivered, no further manual examination is made, except for the purpose of removing the placenta, or of treating some disordered condition of the generative organs. If the opinion of Dr. Semmelweis be correct, these cases should present but few examples of disease. (*c*) To inquire of the Lying-in Institutions in Austria and elsewhere, whether the mortality is less, where there can be no source of infection from the handling of dead subjects. (*d*) To make experiments on animals. My suggestion was adopted by a great majority of the Professors, and a committee was appointed, but the Government forbade the proceeding of the committee. Under these circumstances, I requested Dr. Semmelweis to undertake the experiments on animals. These were accordingly performed on rabbits.

Experiment I. On March 22, 1849, a female rabbit, which had been delivered for a quarter of an hour, was operated on. A brush, dipped in some ill-coloured exudation from a case of endometritis, was introduced into the cavities of the vagina and uterus. The animal appeared well up to the 24th April, when it died.

Post-mortem Appearances. The plicated mucous membrane of the cornua uteri was covered with a dirty reddish-grey fluid exudation. The left pleural cavity contained some fluid; the lower lobe of the lung on that side was covered with a pale yellowish, false membrane. Its parenchyma, as well as that of the posterior and lower third of the upper lobe, was in a state of grey hepatization; the rest of this lung, as well as the right, contained air, and was of a vermillion-red colour. The heart was enveloped in a finely-villous layer of pale yellow exudation, and there were a few drops of fluid matter.

Experiment II. On the 12th April, a female rabbit was treated in a similar manner to the last, about twelve hours after having been delivered of five young ones; and the application was repeated daily. On the 14th April, the

animal expressed pain on the introduction of the brush, the uterus contracted with force, and some thick yellowish-white exudation was pressed out. On April 17th the animal appeared decidedly ill; on the 22nd, diarrhœa set in; and the animal was found dead on the 24th. The brush had been introduced once daily, up to the time of death.

Post-mortem Appearances. The peritoneal cavity contained false membranes, glueing together some of the intestinal convolutions. There was a stiff yellow exudation on the mucous membrane, and in the tissue of the vagina and uterus; the cornua of the uterus were moderately distended, and filled with a dirty reddish-grey exudation. The colon contained some follicles in a state of suppuration; its mucous membrane presented spots of the size of a lentil, partly suppurated, partly infiltrated with yellow exudation: each of the spots was surrounded with an injected vascular area. The lungs were of a clear vermillion red; the upper lobe of the left lung contained a condensed spot, of the size of a bean, infiltrated with blood, and having a purulent point in the centre.

Experiment iii. On the 15th April, a female rabbit, which had been delivered about ten hours, was treated in the same way; and the application was repeated daily up to the 21st. On the 17th, the animal gave signs of pain, and expressed some purulent exudation from the uterus. On the 26th, diarrhœa occurred.

Post-mortem Appearances. The abdominal cavity contained a moderate quantity of fluid and membraniform exudation, glueing together some of the intestinal convolutions. The mucous membrane of the vagina and uterus was covered and infiltrated with a yellow intimately adherent deposit; the cornua of the uterus were much distended, and filled with a reddish-grey dirty matter. The liver presented some spots of the size of lentils, infiltrated with a purulent exudation. Near the termination of the *processus vermiformis* the mucous membrane of the colon presented a spot larger than a lentil, surrounded by an injected area of vessels; it was ulcerated, and covered with a pale yellowish exudation.

Experiment iv. On May 24th, a strong rabbit was operated on, an hour after being delivered of five young ones. The brush was dipped in the blood (mixed with water) of a man who had died of marasmus thirty-six hours previously. On the 25th, it was charged with some pleuritic exudation; and on the 26th and 27th, with some exudation from the peritoneum of a tuberculous patient. The brush was not again introduced; the animal continued apparently in perfect health, and again brought forth young on the 24th June.

Experiment v. On the 2nd of June, some of the peritoneal exudation which had been used in Exp. iv, was applied to a rabbit about twelve hours after delivery; and the application was repeated on the 3rd, 4th, and 5th of the month, after which it was discontinued. The animal appeared in good health. On the 28th, it again brought forth young, and the brush was again applied on the 29th and 30th, charged with pleuritic exudation. The animal continued well, and was killed on the 17th July in performing another experiment. No alterations referable to pyæmia were observed on necroscopic examination.

Experiment vi. On the 10th of June, some purulent exudation from the pleura of a man was introduced into the uterus of a rabbit, some hours after delivery; and from the 11th to the 30th, the brush was dipped in some peritoneal exudation from a man who had died of typhus. The animal continued well, and again brought forth young on the 13th July. On the latter day, the brush was again introduced, and the application was repeated daily up to the 24th. The animal became lean, had diarrhœa, and was found dead on the 30th.

Post-mortem appearances. The pericardium contained a few drops of flocculent serum. There was a dirty whity uneven vegetation, of the size of a pea, on the tricuspid valve, pressing against the *conus arteriosus;* and a similar body was situated on the free margin of one of the divisions of

the valve, intimately united with the endocardium covering its muscle. The inner surface of the right ventricle was covered with a yellowish white granular false membrane. The peritoneum contained some pseudo-membranous and fluid exudation. In the periphery of the liver, near the lower surface, there was a spot of the size of a pea, infiltrated with a stiff yellowish deposit. In the uterus, several veins of remarkable thickness, between the body and the right cornu, were found filled with a stiff yellow exudation.

Experiment vii. On June 16th, some hours after parturition, the brush was applied, charged with pus taken from an abscess between the ribs of a person who had died of cholera. The operation was repeated daily up to the 3rd of July; but the animal remained well, and was again delivered on the 18th of that month. The experiment was now modified, so as to avoid the chance of producing mechanical irritation with the brush. The fluid was injected by means of a gonorrhœa syringe, with a tube three inches in length. Soon after the injection, the animal again ejected the fluid. It was daily repeated up to the 24th of July, and the animal was found dead on the 29th.

Post-mortem appearances. Both pleural cavities contained some thickish yellow exudation. In the peritoneum, there were two ounces of exudation, partly coagulated in the form of a membrane; the uterus was normal, but pale.

Experiment viii. On June 24th, the same animal was operated on, as had been the subject of Experiment iv. The brush was applied daily until July 8. The animal wasted away, was seized with diarrhœa, and died on the 25th.

Post-mortem appearances. The peritoneum contained some yellowish exudation. Closely adhering to the posterior wall of the uterus there was a thin dirty-yellow false membrane; the cornua contained some dirty reddish grey fluid exudation; and, on the border between the vagina and uterus, corresponding to the orifice of the urethra, there was a superficial sloughed spot of the size of a bean, infiltrated with purulent exudation. The ulcer in this situation had uneven undermined edges, and the base was covered with a layer of exudation. The substance of the vagina, for an inch in length, was infiltrated with a deposit of a line in thickness.

Experiment ix. On August 8th, some exudation from the peritoneum of a male subject was injected, a few hours after the animal had brought forth young. It was soon rejected; and the operation was repeated daily until the 15th. The animal appeared ill on the 13th, became lean, and was found dead on the 20th.

Post-mortem appearances. There was some floculent exudation in the peritoneum, and numerous yellow inflammatory spots, mostly of the size of hemp-seeds, on the periphery of the liver. On the mucous membrane of the posterior wall of the uterus, there was an excoriated spot of the size of a lentil: the substance of the organ was infiltrated with yellow exudation as far as the peritoneum. The right cornea was so much infiltrated as to be of double its normal size. There was some free exudation on its mucous membrane. The veins in both broad ligaments were filled with exudation.

Remarks. It is scarcely necessary to mention, that the changes found in the bodies of the rabbits, were the same as those which occur in the human body as a consequence of puerperal disease and of pyæmia in general. It might be objected to these researches, that in them a greater quantity of putrid matter was employed, and that it was, in eight of the experiments, introduced for several days in succession, while on the other hand, the quantity of putrid matter remaining on the hands, when they have been washed—as is always the case—after making *post-mortem* examinations, can be but very small. But this objection does not appear to me to possess much weight, seeing that the operation of putrid matter on the blood does not depend on its quantity; for infection not unfrequently takes place through a wounded part, which is almost imperceptible from its minuteness. It would be judicious, in order to remove all doubt, that more extensive and varied experiments on animals should be performed.

LANGENBECK ON THE APPLICATION OF LIGATURES TO UTERINE AND OTHER POLYPI. DANGER OF PURULENT INFECTION.

The following remarks, which form part of a paper published by Professor LANGENBECK, of Berlin, in the *Deutsche Klinik* for 6th April 1850, are highly important. The occurrence of pyæmia after the Ligature of Uterine Polypi, seems to have scarcely yet attracted notice: yet we cannot doubt the possibility of its occurrence, and of its producing a train of symptoms analogous to those described under the name of puerperal fever or peritonitis. We by no means wish to discourage the system of applying ligatures to Uterine Polypi (on which subject an elaborate essay by Professor Simpson will be found in our Reports of Societies): but we would recommend a careful consideration of the views of Langenbeck to the notice of our readers.

PROFESSOR LANGENBECK'S REMARKS. The numerous instruments which have been contrived for Ligature of Polypi of the uterus and pharynx, shew the great apprehension of hæmorrhage from their excision or evulsion. Even the assurances of Siebold, Dupuytren, and other distinguished surgeons, that there is no greater danger of hæmorrhage from the excision of Polypi than from other operative methods, have not removed this apprehension; and the Ligature of Uterine Polypi is rapidly gaining ground, in spite of the difficulty of its performance. It is true, that the excision of large fibrous tumours from the pharynx and uterus may be complicated with considerable hæmorrhage; but this generally ceases of itself when the operation is ended, or may be quickly and surely restrained by the continued injection of cold water, by compression with the finger, or, in the most obstinate cases, by plugging. The cases, in which actual danger arises from the patient becoming exhausted by hæmorrhage through the cut pedicle of the tumour, are very rare. But the dangers attending on Ligature of the Polypi are far greater; and this operation would certainly be had recourse to only in exceptional cases, if the fatal cases following it were not less apparent than those from the much-dreaded hæmorrhage. A death, occurring some days or weeks after a bloodless operation, seems less terrible than one occurring suddenly from hæmorrhage, under the hands of the operator. The danger of purulent infection, after the application of a Ligature to Uterine Polypi is so obvious, that I have not yet been able to determine on performing this operation. During the last ten years, there have occurred, to myself alone, ten fatal cases of pyæmia after Ligature of Polypi. The larger polypous (fibroid) tumours of the uterus and pharynx are furnished with large veins with thin parietes, doubtless arising from the impediment to the return of blood caused by the dependent position, or constriction by the os tincæ, of the tumour. As the firm parenchyma of these tumours can only be slowly cut through by a Ligature, the blood must still circulate in one part, while another is in a sloughed and softened state. As long as the pedicle is not entirely cut through by the Ligature, pyæmia is to be feared. Entirely independent then of the danger of convulsions, suffocation (in Polypi of the pharynx), secondary hæmorrhage, etc., the application of the Ligature ought to be entirely rejected on account of the danger of pyæmia. But if it be still determined, in spite of the marked success attending the excision of Polypi, and in opposition to which, scarcely a single case of unrestrainable hæmorrhage can be related, to apply a Ligature, I consider it indispensable that the polypus should be immediately excised, that the Ligature should be used only as a precautionary measure, and that it should be removed as soon as the danger of hæmorrhage appears to have been obviated.

It is not my purpose to enter on a critical examination of the various methods and instruments employed in applying the Ligature to Uterine Polypi; as, for the most part, they possess only an historical interest. With very few exceptions, they are all faulty in being difficult of application, in tending to produce violent irritation of the neighbouring parts, and in the Ligature being unable to be removed until the pedicle of the tumour is entirely divided.

REPORTS OF SOCIETIES.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY,

Tuesday, March 12, 1850,

Dr. Addison, President, in the Chair.

On Fatty Diseases of the Heart. By Richard Quain, M.D., Assistant-Physician to the Hospital for Consumption, etc. (Communicated by C. J. B. Williams, M.D., F.R.S.) The author commenced by referring to the circumstances which had directed his attention, five years ago, to the subject of these diseases, to the want of information which then existed, and to the essays which had since been published. He said there were two forms under which fat occurred, as a disease of the heart. In one form, "fat tissue" grew upon and amongst the fibres—concealing them, in some cases, to such an extent, as to lead to the supposition that the heart's walls were composed of fat. In such cases, the fibres may still be found unchanged in structure, when the part is examined with the microscope, but more or less distorted in their course, by the existence of large fat cells amongst them. He referred to the circumstances which seemed to direct the distribution of fat on the heart, and the parts where it was most abundant. In the second form, the muscular fibre became disintegrated, and degenerated into a granular or molecular fatty matter—in such cases, there was not of necessity any fat growth on or about the heart. He traced the progress of this change in the fibre, as shown by the microscope, and presented in drawings the appearances described. He showed the effects which the presence of this fatty matter in the place of muscular fibre must have on the physical characters of the heart, on its colour, its consistence, etc. He pointed out the circumstances by which the appearances were modified, as well as those which guided us in ascertaining its presence. In the next place, under the head of "Preceding Observations on these Diseases," the author gave a very complete account of the extent of our previous knowledge on the subject. He followed by successive steps the progress of our information, from the period of the oldest authors whose writings bore thereon, to the age of Harvey, through subsequent writers, to the present time: he showed that the disease here described as true fatty degeneration of the fibres of the heart, had been recognised, though, like fatty degeneration of the liver, the exact change in the fibre has not been distinctly ascertained. For information on this latter point, we are indebted to the researches of Williams, Peacock, Rokitansky, Paget, Ormerod, and others. The author took occasion here to contrast the characters of fatty degeneration of the heart, with those of fatty degeneration of voluntary muscles.

Thirdly, he traced the circumstance under which these diseases occurred. He showed the relation which the growth of fat on the heart bore to the presence of its elements in the blood, and to the influence of the age, sex, habits of life, etc., of the individual on this condition. On the other hand, he described fatty degeneration as being a process of decay or true degeneration. He established this conclusion, by a series of observations on the microscopical and chemical characters of the substance called adipocere; by experiments made by himself and others, on the artificial formation of fatty matters in albuminous and fibrinous textures external to the body, and by the identity of the appearances in the artificial and the natural processes. He mentioned a great variety of circumstances under which this change took place in the living body, in which it must have occurred independently of any direct communication with the vascular system. He quoted the names of several authorities on these points, but more particularly in refer-

ence to their pathological import, those of Williams, Paget, and Rokitansky; and established the inference, that when the vital properties of these higher animal substances were impaired, they yielded to the physical influences by which they were surrounded, and fell into a class of more simple compounds, shared by them with plants and minerals. He showed, by reference to Mr. Paget's observations, that the first step in this process was an impairment of the nutrition of the organ; and then he showed how this impairment occurred: 1st, the heart participating in a general mal-nutrition of the body; or, 2ndly, suffering locally by disease of the coronary vessels, or as the ultimate effects of endo- and peri-carditis. Numerical illustrations of these facts were given. The author then referred to the diseases which were found in association with this condition, they being chiefly degeneration of other organs, blood-vessels, etc. The most frequent seat of the disease, the age, the sex, the station in life of the individuals, and various facts in connexion with the history of the disease, were also numerically illustrated. The characters of the so-described soft, flabby hearts, and the difference of opinion as to their nature, were discussed, and their relation to fatty degeneration considered.

Fourthly. The effects of these diseases were described as being those connected with impairment of structure and function, causing derangement of the circulation, etc. It was shown, that of fifteen cases of extreme accumulation of fat on the heart, five had suffered from giddiness and coma, eight from syncope, and nine from short breath, languid circulation, etc. Of the fifteen, fourteen had died suddenly—viz., by syncope, or in an analogous condition, ten; by rupture of the heart, three; by coma, one. In reference to the effects of fatty degeneration on the structure and functions of the heart, the author showed that it was found in connexion with hypertrophy in thirty-nine out of sixty-eight cases. He believed this to be due to hypertrophied hearts suffering from impaired nutrition more readily than other hearts—not, as Rokitansky supposed, to a disturbance of the balance of the nervous functions. The heart may be found unchanged in size, or decreased. The diminished consistence of the tissue, permitted the occurrence of some of the most fatal lesions to which the organ is liable—viz., rupture, which took place in twenty-five of the sixty-eight recorded cases. In twenty cases, the rupture perforated the walls of the heart. In five other cases, it was incomplete, being confined either to the internal surface, the external surface, or in the substance of the heart. Rupture in the substance gave rise to the appearance called by Cruveilhier cardiac apoplexy. The blood effused in these cases may become encysted, and, losing its colour, give rise to the appearance of an abscess. Cardiac aneurism may also be formed. Illustrations of these facts were given from the tables of cases. The effects of fatty degeneration on the heart's functions gave rise to coma, and even apoplexy. The power of the right side of the heart being weakened, its cavities became filled, and the circulation obstructed. Illustrations from preceding writers on this point were given. The impaired powers of the left side of the heart were, on the other hand, a frequent cause of faintness or syncope; it was present in fifteen cases. This syncope may amount to a mere feeling of faintness, or to so complete an arrest of the vital powers as to cause death. Sudden death occurred in fifty-four of sixty-eight cases, in twenty-one of which it was by syncope. Pain in the region of the heart and breathlessness, with certain peculiarities in each, were also numerically illustrated, and the causes on which they depended considered. The syncopal feelings, the pain, and the breathlessness, may occur independently of each other, or in combination; they may thus give rise to the phenomena known as angina pectoris. It appeared to the author, that this condition of the heart afforded, in many cases, a sufficient explanation of the pathology of this disease; and he expressed his opinion, that many of the cases in which no disease of the heart had been observed, in which the symptoms were attributed to disease of the

coronary arteries, or to fat on the heart, were, in all probability, examples of this fatty degeneration, which had so long been overlooked. He confirmed this opinion by the details of cases in the tables.

Hereditary predisposition, and the duration of the disease, were treated of so far as the facts permitted.

Fifthly. The symptoms and diagnosis of these diseases, more particularly in reference to fatty degeneration, were described. A distinction was drawn between those cases in which the heart, participating in the general impairment of the health, was perhaps equal to the demand made on its functions, and those in which the heart, being impaired by local causes, suffered out of proportion to the system generally. In the latter case, the symptoms were very unequivocal. In addition to the phenomena referred to in the preceding section, the pulse almost always gave indications of the condition of the heart. It was recorded, in thirteen cases, as being irregular; in fourteen, as being weak; in eight, slow; in a few, as being full, regular, or quick; in none, strong. The feeling of fatigue, from slight causes, particularly from ascending heights, the breathlessness, etc.,—all progressive, from being so slight as scarcely to attract notice, to the most extreme suffering on exertion, were mentioned. An anxious expression of countenance, mental irritability, and copious sweats from trifling causes, were also noticed. The physical signs of the disease—viz., feeble impulse, feeble first sound, extended dulness, perhaps a murmur with the first sound, from disease of the columnæ carneæ, or imperfection in the second sound, were also discussed.

Sixthly. The treatment, which in some cases had been found more successful than might have been supposed, was such as was calculated to improve the condition of the blood. We could not restore lost fibres, but we could render those which remained more effective; we could improve the material to be supplied by the blood, and we could render this fluid a better stimulant. The author referred particularly to the management of the digestive organs, to the use of iron, and the relief of paroxysmal attacks by the use of antispasmodics. Narcotics were not borne, and he mentioned examples of their injurious effects, as also the ill effects of exertion or of over-exercise. Leeches to the region of the heart, followed by counter-irritation, had, in some instances mentioned, been found very useful in preventing the return of distressing paroxysms of dyspnœa and pain. The author concluded by a quotation from Boerhaave, aptly illustrating the formidable effects of this otherwise inoffensive material, when it occurs in a situation to which it does not belong. He apologized for the length of his communication, which was due to the importance of the subject and its numerous relations. The paper was accompanied by tables, containing the abbreviated histories of eighty-three cases of these diseases, and by a number of beautifully executed drawings.

[Dr. Quain's elaborate and able communication occupied the whole sitting, so that there was no opportunity for discussion.]

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

November 21, 1849.

James Syme, Esq. President, in the Chair.

Detection and Treatment of Intra-uterine Polypi. By J. Y. Simpson, M.D. [The dilatation of the os uteri, by sponge-tents, was formerly advocated by Dr. Simpson; and in the present paper, the same practice is recommended and enforced by the details of some very interesting and important cases. The communication appears as an original article in the *Edinburgh Monthly Journal* for January, 1850, from which we subjoin some extracts.]

"The sponge-tents used by myself and my professional brethren in Edinburgh, are manufactured by Duncan, Flockhart, and Co. They are of a narrow conical, or pyramidal form; and are used of many different sizes and

lengths, according to the object in view. These tents are made by dipping a piece of sponge in a strong solution of gum-arabic—tying and compressing this sponge around a central wire, as its axis, into the required conical form, by a continuous layer of whip-cord, drying it thoroughly, removing the cord, and, subsequently, slightly coating the surface of the tent with tallow, or axunge and wax, to facilitate its introduction. The central wire passes only for half-an-inch or an inch, into the base of the cone, and the opening left by it serves as an aperture to transfix the tent with the tip of the metallic director, used for guiding and introducing the tents through the os uteri. They are introduced like the uterine sound or the catheter; the handle of the metallic director, with the sponge affixed to it, is held and manipulated by the left hand, while the fore-finger of the right hand touches the os uteri, in order to guide and direct the apex of the tent into that opening. The old forms of sponge-tent used by surgeons, and made of sponge steeped in preparations of wax, required, for their expansion and development, the aid of heat, in order to dissolve their retaining ingredient. The tent I have described, made by steeping sponge in a solution of gum, requires moisture, and not heat, for the solution of its retaining material, and for the expansion of the sponge. Very generally, the secretions of the surrounding mucous canal afford a sufficient quantity of moisture for these two purposes; but, if not, a small quantity of tepid water may be injected from time to time into the vagina. Usually, a well-made tent takes twenty or thirty hours to expand to its full extent in the os uteri; and dilates to four or five times the diameter it presented in its original compressed state. Generally, the first tent opens up the os and cavity of the cervix, and allows the finger ample space to examine sufficiently its contents, and the state of its parietes. If it be necessary to open the uterine cavity higher, so as to enable the finger to pass into the cavity of the body of the organ, a succession of tents is usually required; and they must be passed completely through the os internum or narrow portion, lying between the cavity of the cervix and cavity of the body of the organ. The use of the tent for a day, generally, as I have already stated, dilates the os uteri and cavity of the cervix sufficiently; and the employment of the sponge is accompanied with little or no feeling of uneasiness. When it is necessary to examine the state and condition of the interior of the cavity of the body of the organ, the persevering use of a series of larger and larger tents for several days, is usually requisite; and the dilatation of the os internum and body of the organ, sometimes, but not always, causes a feeling of uneasiness and pain, which may require the use of an opiate. The tent is always prepared with a string affixed to its base, to allow of its easy removal. In using sponge-tents, it should be remembered, that, when sponge is in contact with the maternal passage for some hours, it always exhales, when removed, a very fœtid odour.

"For dilatation of the unimpregnated os uteri, the tent should be selected as regularly conical as possible; and with the apex neither too blunt and rounded to pass the os, nor too slender and flexible so as to double back in the attempt. The spirally grooved surface of the tent, resulting from the compression of it by the whip-cord during its manufacture, tends to retain it *in situ*, till its expansion commences. It, perhaps, ought to be added, that the introduction of the sponge-tent into the os and cavity of the uterus, should be effected without the use of the speculum. The sense of touch serves, in this, and some other analogous operations, infinitely better than the sense of sight.

"By the use of sponge-tents introduced daily, and of increasing size and length, we may reach a polypus, when affixed and sessile even upon the fundus uteri. One of the first cases in which I dilated the uterine cavity to its extreme height, was the following:—

"Case. In 1844, a patient, æt. thirty-six, under the care of Dr. Graham, of Dalkeith, had a miscarriage, from the effects of which she never satisfac-

torily recovered. Previously, she had borne four children. When I first saw her, two or three years afterwards, she was emaciated and extremely pallid, from the excessive loss of blood which she had been sustaining for some time; and her weakness was such, that it was with difficulty she could rise and walk across her bed-room. In August, 1847, I dilated fully the interior of the cervix and body of the uterus, by a succession of sponge-tents, and at last, felt a hard, round fibrous polypus, seated at the very fundus of the uterus, and projecting, of the size of a walnut, into the upper part of the cavity of the organ. Dr. Ziegler, Dr. Toogood of Torquay, and other professional friends, confirmed this diagnosis. It was impossible to ascertain how it was pediculated, or to operate upon the pedicle. We could only reach the round body of the tumour; and that I compressed strongly and repeatedly in the blades of a lithotomy forceps, with the view of breaking down its tissue, so as to destroy the vitality of the polypus. A purulent discharge followed, and three largish pieces of organised structure were subsequently cast off. Her recovery of health, after these discharges ceased, was gradual, but perfect. There has been no return of menorrhagia. About a year ago, she called upon me; and the change from excessive pallor and emaciation of the face, to the hue and ruddiness of health, was so great that I had difficulty in being convinced of the identity of my former patient.

"The polypus, while still included within the uterus, is principally liable to give rise to the following groups of symptoms:—

"1st. Menorrhagia, in consequence of the discharge of blood from the surface of the tumour. The attendant hæmorrhages take place particularly at the menstrual periods, but are apt to recur also at other times; and the blood is sometimes fluid, sometimes coagulated; occasionally, there is an almost constant red stained discharge. The effects of these repeated floodings upon the constitution of the patient, vary with their amount; but if they go on increasing (as they usually do) in quantity and frequency, the patient's constitution gradually becomes more and more shattered and broken down by the amount of hæmorrhagic discharge; and all the symptoms of anæmia, in their most marked degree, at last supervene, as pallor of the face and lips, great muscular debility, palpitation, vertigo, dyspepsia, œdema, etc.

"2dly. The discharge of mucous, purulent, or serous matter from the cavity of the uterus, in consequence of the mucous membrane of the organ becoming often irritated, inflamed, and even ulcerated by the presence and pressure of the polypus. If a severe leucorrhæal discharge is present, and we ascertain by the speculum that it does *not* originate in ulceration or other morbid state of the external surface of the cervix, or of the vagina; and if we further detect, with the speculum, the discharge issuing from the cavity itself of the uterus, the probabilities of it originating in some pathological irritation within the uterus, will be necessarily increased. Sometimes the discharge, in cases of polypi, is fœtid, especially if it be retained, or mixed with decomposing blood.

"3dly. Increased size of the cervix and body of the uterus, in consequence of its interior being distended by the presence of the polypus, is traceable in those cases in which the polypus is of any great size. Not unfrequently, intra-uterine, like vaginal polypi, are found combined with the presence of fibrous tumours in the walls of the uterus; and by these tumours, the magnitude of the organ is increased, and its shape rendered more or less irregular. Fibrous tumours of the uterus are seldom or never situated in the walls of the cervix; and if the swelling and distension affect the cervix, there is consequently much more chance of its being a polypus, and not an interstitial fibrous tumour, than when we have similar symptoms attendant upon a similar augmented state of the body of the organ. Further, the probability of the disease being intra-uterine polypus would be increased, if, on successive examinations, we had an opportunity of ascertaining that the large and distended state of the cervix was descending gradually lower and

lower down towards the os; for polypi, in their progress and descent, gradually dilate the cervix from above downwards, in the same way as happens in pregnancy or abortion. They are born by a kind of chronic labour.

"4thly. There may be symptoms of irritation and pressure upon the bladder, rectum, etc., if the polypus happen to be so large as to exert mechanical compression upon these or other parts; or dysmenorrhœa, if it fill up the cavity of the cervix. And sympathetic pains may be present in the loins, limbs, etc.; or there may be sympathetic disturbance of the stomach, heart, etc., if the uterus be much irritated and excited by the presence and distension of the polypus.

"But one or more of the preceding groups of symptoms may be altogether absent, though the uterus contain an intra-uterine polypus. The mechanical and sympathetic symptoms, last alluded to, are the most uncertain of all. For while almost all uterine diseases, however intrinsically different, give rise to similar secondary and sympathetic symptoms, we have often, in other instances of the very same diseases, these same symptoms entirely wanting; just as in one woman, during pregnancy, we sometimes see severe, even serious, local and constitutional symptoms; and in another woman, or even in the same woman in another pregnancy, we see the same condition of the uterus unattended by any special local or constitutional disturbance. Again, there may be no ascertainable increased volume of the uterus, as the polypus, especially if it be vesicular, and originate in the interior of the cervix, may be far too small to lead to any appreciable augmentation in the size of the organ, although, notwithstanding, the menorrhagia may be great; for the extent of flooding does not depend on the size of the polypus, small polypi, like small hæmorrhoidal excrescences, often being the source of severe and repeated hæmorrhages. Further, the leucorrhœal discharge which is sometimes attendant, may be entirely absent, as the polypus may not be irritating the mucous surface of the cavity in which it is inclosed. And lastly, polypi, occasionally, though not very frequently, are present for a long series of years without producing any degree of hæmorrhage or menorrhagia. In one case, for example, there was a state of long standing amenorrhœa, instead of menorrhagia, co-existent with presence of a polypus, though the two conditions (the amenorrhœa and polypus), had, probably, no causal relation to each other.

"No remark could be, pathologically and practically speaking, more sound and true than that which Sir Charles Clarke many years ago made:—'The true character of any disease of the internal female organs can *only* be ascertained by examination.'[1] With this view, in order to enable the finger to reach and examine the cavity of the uterus, the os and cervix must be opened up by a succession of sponge-tents, in the way already described. When an adequate degree of dilatation is obtained, the finger will be enabled to touch the tip of the polypus; and then the pediculated or polypous character of the tumour may be farther made out, by passing either the finger or a uterine sound between its body and the containing cavity of the uterus. In making this examination, as in making most other examinations of the uterus, a rule requires to be followed which is too often forgot, namely, to use both hands for the purpose. For if we are examining the uterus internally, with the forefinger, or fingers of the right hand, the facility and precision of this examination will be found to be immensely promoted by placing the left hand externally over the hypogastric region, so as to enable us, by it, to steady, or depress, or otherwise operate upon the fundus uteri. The external hand greatly assists the operations of that which is introduced internally; and farther, we can generally measure between them, the size, relations, etc., of the included uterus.

"If without, or before using sponge-tents, we are desirous to examine at the

[1] Diseases of Females, vol. i, p. 250.

time when the os uteri is naturally most relaxed, we shall find that time to be either immediately after a menstrual discharge, or immediately subsequent to any severe attack of intercurrent hæmorrhage. Under such circumstances, we can sometimes introduce the finger partially into the os uteri, and ascertain the presence of any morbid body in the lower segment of the cervix; when, in the same patient, at other times, this orifice is so completely shut as to prevent entirely such a proceeding. Sometimes, indeed, a small or elongated intra-uterine polypus will pass through the os uteri at these times, so as to be felt by the usual vaginal examination; but will become retracted into the cavity of the cervix, during the interval between the hæmorrhagic discharges.

"The Treatment of Intra-uterine polypi requires to be varied according to different circumstances, but particularly by the tendency or probability of the tumour passing downwards or not through the os; by the effects of the symptoms or the urgency of the case; and by the size and site of the polypus.

"Two plans of procedure may be followed, according to the nature and necessities of the case, viz: *First*, to wait till the polypus descend farther; or, secondly, to remove it immediately. It is a generally acknowledged principle in obsteric surgery, that a polypus of the uterus should be extirpated as early after its discovery as possible. But when such a tumour is discovered still included within the uterine cavity, and the polypus seems gradually but certainly making its way downwards through the cervical cavity, and the hæmorrhage and other symptoms are not urgent, it will assuredly be better to wait for its descent through the os; for, after that, its removal becomes much more easy and simple. The dilatation of the os and cervix by the sponge-tents will promote and facilitate its descent; and perhaps the internal use of the ergot of rye may aid it. But the degree of attendant hæmorrhage and debility may be too great to entitle us to postpone the removal of the polypus; or the tumour may be attended by such a short pedicle, as not to be capable of leaving the uterine cavity without dragging down with it, or inverting the fundus or some parts of the parietes of the uterus; or it may be retained in its descent by adhesions formed between the surface of the uterus and the surface of the polypus. I once witnessed the dissection of a case of a large fibrous polypus included in the cavity of the uterus, and where inflammation had been present before death; the surface of the polypus was adherent to the surface of the uterus through the medium of a recently effused false membrane. Even when an intra-uterine polypus has descended so far as even partially to open up the os uteri, it may remain in that situation for such a length of time, and with such results, as to place the patient in no small degree of danger.

"But, *secondly*, the severity of the attendant hæmorrhages, or the improbabilities of the speedy and entire descent of the intra-uterine polypus, may induce us to remove the tumour at once; and certainly this may be effected in most cases, though with greater difficulties than in cases in which the polypus has passed down into the vagina. To admit at all of the removal of an intra-uterine polypus, of any considerable size, the os uteri must be previously very fully dilated by sponge-tents; and perhaps it will sometimes be found necessary, at the time of operating, to gain additional freedom, by dividing any obstructing band of the os or cervix that may not have been fully dilated by the tents. Afterwards, we shall require to proceed differently in different cases, in order to destroy or remove the polypus. We may only be able to accomplish this object by contusing and crushing the tumour. In the instance in question, I grasped the polypus, for this purpose, with strong lithotomy forceps. In another similar case, after fully dilating the os and cervix, I seized a large intra-uterine polypus between the jaws of a screw-propelled lithotomy instrument—invented for the purpose of crushing vesical calculi—and was enabled, by it, to crush and destroy readily the structure

and vitality of the included tumour. Occasionally, we may be enabled to divide the stalk of the polypus with a silver wire or ligature, acting on the principle of the chain-saw; or we may reach it with very curved blunt-pointed scissors.

"The instrument employed (in a detailed case) is a modification of one kindly sent to me by my friend, Dr. Sabine, of New York. I am told it has been successfully used by various American practitioners, for the removal of polypi in the vagina. The advantage which it possesses over the instruments of Niessens, Gooch, Davis, and others, in the removal of intra-uterine polypi is, that the screw power, with which it is furnished, enables us to use it with the power of a small chain-saw, for the immediate division of the pedicles of the polypi. And it is almost superfluous to observe, that if we can finish our operation, it will be much safer for our patient than leaving a rough instrument within the cavity of the uterus. The instrument itself consists of two parts, viz., two hollow canulæ, like those pertaining to the instruments of Niessens and Gooch; and of a second part, resembling the polypus instrument of Graefe of Berlin, with this difference, that it has a ring affixed to its top, of a heart-shaped figure, and intended, first, to receive the two canulæ, with their contained ligatures, and afterwards to serve as a point of resistance during the cutting action of the ligature upon the pedicle of the tumour. The canulæ and ligatures are first applied in the same way, and according to the same rules, as those of Niessens and Gooch. After the pedicle is encircled by the ligature, the two lower extremities of the canulæ and included ligatures are passed through the ring of the second portion of the instrument. This second portion of the instrument is then run up, with its ring surrounding the included canulæ, till it reaches the pedicle of the tumour; the projecting side of the ring being turned towards the pedicle. The canulæ are then slipped off, and withdrawn, leaving the wires or ligatures alone in the terminal ring of the instrument. Subsequently, these wires are twisted around, and fixed upon, the knob attached to the screw. Lastly, by moving the knob downwards, by the operation of the screw, the ligature is made to cut into and through the pedicle. [Plates of the instruments are given.]

"The preceding remarks, relative to the treatment of intra-uterine polypi, principally refer to these tumours when they happen to be of a large size. But uterine polypi are often too small to be removed by the knife, scissors, or ligatures; and yet these small polypi not unfrequently lead to severe and long-continued menorrhagia. From the analogy of hæmorrhoidal tumours, we know that the mere size of a polypus is not to be taken as any measure of its capability of producing hæmorrhage. Small vesicular, mucous, or cellular polypi sometimes grow from the fundus uteri, giving rise to considerable and long-continued hæmorrhagic discharge. I have preserved specimens of them from the dead subject, and have met with them in the living. They can hardly be properly termed polypi, as they are scarcely pediculated at their attachment, and sometimes short, but, in other cases, long and slender in their body. The following case may be cited as an illustration.

"Case. A lady, the mother of ten children, became irregular in her menstrual discharge during her forty-fourth year. At times it was wanting at the usual monthly periods, at others it amounted to menorrhagia. About a year after this irregularity commenced, such an amount of fluid blood and coagula escaped, as at first to lead, on her part, to some suspicion of miscarriage; but it continued to go on profusely for two or three weeks. At the end of that time, I visited her, with Mr. B. Bell and Dr. Malcolm. On examining the uterus, we found a small vesicular polypus attached to the inner surface of one of the lips of the os, and it was easily removed by avulsion. The discharge, however, was not abated in consequence, as we expected. A series of sponge-tents was then introduced, so as to open up, first, the cavity of the cervix (which was found free from additional polypi), and ultimately the cavity of the body of the uterus. When the distension of the whole uterine cavity was at last

completely effected, both Dr. Malcolm and I found that we could touch two or three small slender polypoid bodies, hanging from the very fundus of the uterus. I removed them cautiously from the surface to which they were attached, with the nail of the first finger. After this the hæmorrhage ceased, but some local treatment was required to cure the ulcerated state of the cervix. The polypi were removed in April. The patient went soon afterwards to spend the summer in the country, where she soon gained strength, and enjoyed much-improved health. I saw her lately. The menorrhagia had not recurred, but she still looked anæmic, having never recovered her colour since the hæmorrhages in spring.

"The most common site for the origin of small vesicular polypi, is the interior of the cervix uteri. In fact, the small cellular or vesicular form of cervical polypus, is infinitely the most common form of polypous disease of the uterus. These cervical vesicular polypi are generally of a small size, like a pea, or orange pip, and vary from this to the size of a hazel-nut. Sometimes they are sessile; and sometimes pediculated. Occasionally they are single, or they form a single complex cluster; but more frequently they are gregarious. Indeed, it is the rule rather than the exception to it, that when we find one, we shall find, on further search, that there are others, sometimes to the number of four, five, or six, springing from other points of the interior of the cervix, and not discoverable till the cavity of the cervix is dilated by a sponge-tent. When hanging from the os uteri, their stalk is sometimes so loose and long, and the small depending polypus is itself so small and soft, that it moves away before the finger in making a tactile examination; and one unaccustomed to this peculiarity, will not feel perfectly sure of the presence of such a polypus till the speculum is used, when the body of the polypus will be easily seen, generally of a cherry-red or purplish colour. Such polypi, though small, are often apparently the source of much menorrhagia and leucorrhœa, for they almost always co-exist with, and probably produce, some degree of ulcerative inflammation of the contiguous surface of the cervix.

"In trying to remove these small vesicular polypi of the cervix, it is, therefore to be held in recollection, that there are generally more than one present; and that, to ascertain this point with any precision, it is necessary to dilate and expand the cavity of the cervix with a sponge-tent.

"In more than one instance, I have found these polypi (when their pedicles were perhaps long and easily broken) come off, imbedded in the surface and foramina of the sponge, which had torn them off during its expansion. But, in twenty-nine out of thirty cases, more methodic measures are required for their removal,—as scratching them off with a sharp nail, seizing and tearing them off with polypus forceps, or dividing their stalks with a pair of scissors. If we can use the speculum, these modes of removal are greatly facilitated by the sense of sight. Indeed, if we require to use the polypus forceps or scissors, for the removal of these small polypi, guided by touch alone, we shall generally find the operation, though apparently simple in principle, one which is tedious and difficult to perform in practice.

"We find, in some cases, these vesicular polypi in all their stages of formation, from small shut cysts, up to pediculated vesicular tumours. When such is the state of matters, we can only remove those that are more fully formed, by the nails, scissors, or forceps. To effect a complete cure, we require other means; and for this purpose the *application of caustics* to the mucous membrane of the cervix answers every indication. Nitrate of silver generally proves too weak for this purpose, unless repeated very often, and combined with scarification of the mucous surface. We possess a far more potent and certain caustic for the purpose, and one that is perfectly manageable, in potassa fusa. The surfaces of the os and cervix, when small vesicular polypi exist, are often found to be the seat of chronic inflammatory ulceration; and sometimes the submucous tissue, and the structure of the cervix, is also the seat of chronic inflammatory hypertrophy and induration. When such a

combination exists, the potassa fusa is doubly useful, as its application at once destroys the polypi, and sets up a new and healthy action in the affected and morbid tissues of the cervix. I have described, elsewhere, its great value and mode of application in inflammatory induration of the cervix,[1] and the power we have of immediately arresting and limiting its action by the neutralizing effects of acetic acid. I need only add here, that I have now repeatedly found this caustic of the greatest possible use in obstinate and complicated cases of vesicular polypi of the cervix, such as I have above alluded to. In illustration of its effects, I shall cite only one instance, and that because it was a case which was peculiar in several respects.

"Case. On the 1st October last, I was called to see a lady who had been losing large quantities of blood for three weeks previously, despite of all the means which had been tried for its suppression. The patient's strength had become greatly exhausted. She was between forty and fifty years of age; was the mother of a family, and for some years past had suffered under occasional menorrhagia. Three years ago, a uterine polypus had been detected at Brussels, and afterwards removed in London, apparently with some difficulty, as the first physician, who attempted it, failed. Her present attack of hæmorrhage was much more long-continued and severe, than those that had occurred previously. Before being able to make a tactile examination of the uterus, I had to remove several large clots of blood lying in the vagina. I found the anterior lip of the os uteri very much enlarged, indurated, and roughened on the surface. By the speculum we saw this lip greatly enlarged, and dotted over with small pediculated red-coloured polypi like red currants; and the use of the mop showed them to be the source of the flooding. About a dozen of these small red polypi were within the field of the speculum, but others could be felt on the internal aspect of the enlarged lip. As it seemed hopeless to attempt to detach them all one after another by the forceps, and as doing so would not remove the suspiciously indurated and enlarged anterior lip of the cervix, I at once had recourse to the application of potassa fusa to the diseased lip itself, and melted it down, with the polypi attached, by decomposing upon it a couple of sticks of potassa, of above an inch in length each, and followed this immediately by the free and abundant injection of vinegar to neutralize the alkali. Subsequently, under the use of astringent injections and medicated pessaries, the surface took on a healthy cicatrisation, and her health greatly improved under the kind and able care of Dr. Anderson (of Jedburgh). I saw the patient in Edinburgh two months afterwards, on her way home to London. There were no remains of the induration or polypi. The uterus felt natural in size, and the surface of the cervix was entirely cicatrised. There has been no recurrence of the menorrhagia. The menses have been present once, but not in unnatural quantity."

OBITUARY.

Burns, Dr., F.R.S., the eminent and much respected Regius Professor of Surgery in the University of Glasgow, aged 74, drowned on board the steamer Orion, on 18th June, in her passage from Liverpool to Glasgow. This ill-fated vessel struck the rocks close to land, on a clear morning, and went down in a few minutes. The loss of life was very great; but probably all might have been saved, had there been a proper provision of boats or life preservers.

Crosse, John Green, Esq., M.D., F.R.C.S., Senior-Surgeon to the Norfolk and Norwich Hospital, and one of the Vice-Presidents of the Provincial Association, at Norwich, on 9th June. Dr. Crosse, acquired a well-earned reputation, not only in the provinces, but in London, by his numerous and valuable contributions to the advancement of science, published principally in the *Transactions* of the Provincial Association. His chief work was the "Essay on Urinary Diseases", for which he obtained, from the Royal College of Surgeons, their Jacksonian prize in 1833. Dr. Crosse was a member of several distinguished societies, both at home and abroad, and an M.D. of St. Andrews.

[1] Edinburgh Monthly Journal of Medical Science for 1847-8, p. 71.